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ABSTRACT

This report describes a project which examined special education teacher stress and burnout during the trainee (N=358) and inexperienced teacher (N=357) periods. The project's two goals were: (1) documentation of the relationships among teacher background, preparation, organizational variables, and occupational stress and burnout variables through trainee and beginning teacher levels, as each is related to role conflict and role ambiguity; and (2) identification of the interrelationships among these variables within and across years. Most of the document consists of appendixes, including the following published and unpublished papers: "Variables Related to Stress and Burnout in Special Education Teacher Trainees and First-Year Teachers" (Michael Fimian and Linda Blanton); "Stress, Burnout, and Role Problems among Teacher Trainees and First-Year Teachers" (Fimian and Blanton); "A Longitudinal Analysis of Variables Related to Special Education Trainee and Teacher Stress and Burnout" (Fimian); "Unmet Needs, Role Problems, and Stress: Predictors of Occupational Burnout among New Teachers" (Fimian and Philip Fastenau). Additional appendixes include a mockup of the information sent to each survey respondent, samples of the machine scorable forms, and the computer program used to analyze the data. (DB)

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Project Summary:
A Longitudinal Study of Teacher Trainee and Teacher Stress and Burnout

Project No: 023UH7001
Grant No: G008630140

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INTRODUCTION

There presently exists a growing interest in teacher stress and burnout. In-class teacher mental health has been much discussed in the literature, but only a limited amount of research has actually been conducted. During the early 1980's interest in teacher stress burgeoned. With the exception of a few articles and dissertations, what has not been produced are data-based studies that would verify and describe the parameters of the phenomena know as teacher stress and burnout or the variables that contribute to elevated stress or burnout levels across different stages of professional development. The research that has been conducted has been of a primarily "one-shot" basis. Until this projects inception, only one article addressed the subject of longitudinal teacher stress and burnout research and this merely suggested that longitudinal work needed to be conducted. At a time when professionals are seeking answers as to why teachers are leaving education, few have actually been investigating the reasons why so many choose to do so.

PURPOSE OF THE PROJECT

The General Problem

Clearly, little is known about the incidence, degree, and effects of classroom stress and burnout upon special education teacher trainees (hereafter termed "trainees") and inexperienced teachers (hereafter termed "teachers"). It is generally considered that professional development in the schools, at any given time, is at least somewhat stressful. Few data exist, though, that would document the growth, change, and year-to-year fluctuations of stress and burnout, or of possible antecedents of these problems -- academic or personal characteristics, role conflict, or role ambiguity. With the exception of two articles reporting earlier results of this project (Fimian & Blanton, 1986, 1987), no other information exists to date which addresses such problems across both preprofessional and professional stages of growth. Since so little has been verified with teacher trainee and inexperienced teacher populations, few stress management interventions have yet been developed that are actually drawn from the "real world" that would help support newcomers to the profession.

Significance of the Problem

It has been speculated that teaching can be stressful, particularly during the first few years of professional life. Some estimates place first-year mortality in excess of 25 percent and that, for one reason or another, as many as 20 percent of all beginning teachers will leave education during their first few teaching years. Additionally, there is evidence that the best and brightest teachers leave the earliest. Overall, this contributes significantly to the estimated 30,000 special education teachers who annually "drop out" of the classroom. Teacher retention may not be the primary issue, however. Most would agree that the teacher's "personality" and "mental health," as reflected in classroom behaviors, perceptions, and attitudes are important. Of concern, therefore, would be those teachers who not only "retire" after a few years of teaching, but who also remain in the classroom for an additional fifteen years. Unfortunately, the development of job-related perceptions and behaviors during the preprofessional and early professional stages of development -- some of which could lead to the problem of stress and burnout -- have not been adequately documented.

In order to more clearly understand this initial growth and development -- or maladaptive forms of it -- it was necessary to address a number of questions. First, did stress strengths vary across levels of professional development (i.e., pre-intern, intern, and student teaching) and early professional development (i.e., first through fourth years of professional experience)? And, were these stress/burnout levels at all related to certain personal, academic, organizational or role variables? Information derived from "one shot" studies often differs from that of longitudinal perspectives. Did stress and burnout levels vary from year to year through both preprofessional and early professional stages of growth? Did role problems vary from year to year? Did the antecedent variables or "sources" of stress and burnout effect stress levels from year to year? Did preprofessional stress, burnout, and role problems predict later professional stress, burnout, and role problems? This project addressed each of these concerns by answering nine research questions, specified later in this report.

Specification of Project Objectives

There were two goals related to this project:

A. to document the relationship among teacher background, preparation, organizational variables, and occupational stress and burnout variables through trainee (or preprofessional) and teacher (or professional) levels, as each may be related to Role Conflict and Role Ambiguity; and

B. to determine the interrelationships among these variables, within and across years.

This last goal documented the annual development of, and means of coping with, problems that face beginning teachers. A model related to these variables is presented in Figure 1. Data gathered from this survey were used to test the relationships among these variables. To reach these goals, however, four project objectives needed to be met:

01 To determine the extent to and fashion in which each variable impacts both teacher trainees and teacher; and the degree to which the academic, role, organizational, and stress and burnout variables are interrelated with one another.

02 To determine the extent to and fashion in which personal, academic, role, and organizational variables predict stress levels of trainees and teachers.

03 To determine the extent to and fashion in which personal, and academic, role, and organizational variables predict the burnout levels of trainees and teachers.

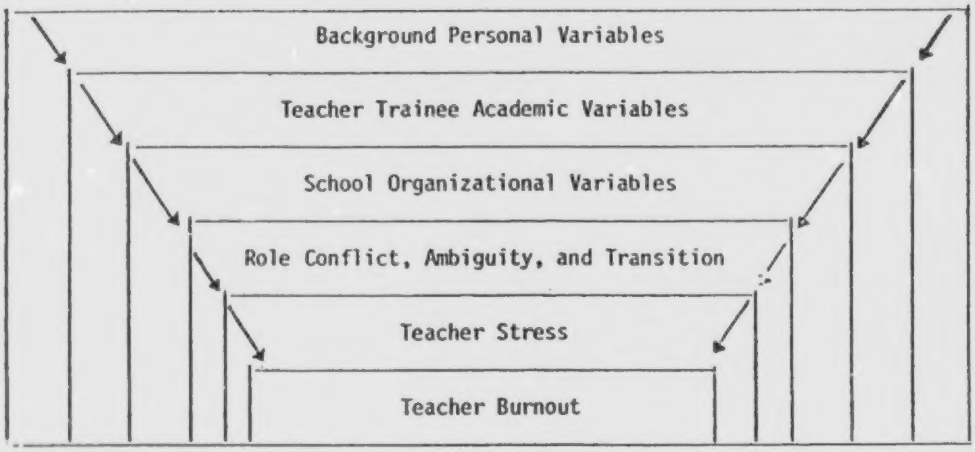
Background Personal Variables
Teacher Trainee Academic Variables
School Organizational Variables
Role Conflict, Ambiguity, and Transition
Teacher Stress
Teacher Burnout

Figure 1. Model of the relationships among teacher classroom stress and burnout, role and school organizational variables, and teacher trainee academic and background personal variables.

04 **To determine: (a) the extent to and fashion in which organizational and role variables, stress strength, and burnout intensity change across three levels of teacher traineeship and four levels of teacher experience; and (b)** the extent to and fashion in which each predicts future stress and burnout levels The relationships between the teacher/trainee stress and burnout variables and the academic, organizational, and role variables were determined.

Completing Objectives 01 through 04 allowed the investigator to determine both the concurrent and predictive strength of these relationships. Variables and categories of variables are noted in Table 1.

Specification of Research Questions

As noted in Table 2, there were nine Research Questions (RQs) which relate to the conduct of Objectives 01 (i.e., RQ1, RQ2), 02 (i.e., RQ3, RQ4), 03 (i.e., RQ5, RQ6) and 04 (i.e., RQ7, RQ8, RQ9). Questions 1 through 6 determined the concurrent relationships among the personal, academic, organizational, role, stress and burnout variables, while Research Questions 7 through 9 determined the predictive and longitudinal relationships between and among these variables. Additional details related to the Research Questions are outlined in Table 3. Final analyses were not conducted until April and May of 1988.

ACCOMPLISHMENTS

There have been a number of accomplishments yielded during the second project year. First and foremost, all project activities, and more, that were to be addressed or completed by this date (note Tables 3 and 4) have been done so. Also, since many of the survey respondents in this sample expressed an interest in receiving feedback in terms of their stress and burnout levels, all have been sent a synopsis of the five-year project and a summary of their stress and burnout levels in comparison to 3,401 other teachers who have completed the Teacher Stress Inventory.

Second, over 1,900 articles on teacher stress and burnout have been identified, photocopied, reviewed, cross-referenced by one or more of over 130 descriptors, and entered into a MultiMate Onfile reference file. This software program allows the Project Director to generate a list of databased and non-databased articles related to one or more of the descriptors.

Third, two articles based on the data have already been published in Teacher Education and Special Education and the Journal of Organizational Behavior (Note Appendix A). These articles were coauthored by Dr. Fimian and a colleague, Dr. Linda Blanton. Additional dissemination activities included the development of two slide shows -- one that describes the results of the present study and an other that presents a general stress presentation to teachers. At the end of this project year, two additional manuscripts have been prepared and submitted for publication. These can be viewed in Appendix B.

Fourth, four Graduate Student Research Assistants have been employed at one time or another as of mid-August, 1986. Inservice training for these students on the use of microcomputers and various software programs (e.g., MultiMate On-File, MultiMate Word Processing, Express Graph, Lotus 123, and Boeing Graph has progressed satisfactorily. Peripherally, these skills have resulted in the authorship of an additional ten articles not directly related to this project, but directly related to occupational stress.

Fifth, two presentation proposals were submitted to the Council's for Exceptional Children National Conferences in both Chicago (1987) and Washington, D. C. (1988) were accepted. The project and project updates were presented and discussed on afternoons of Wednesday, April 22, 1987 and Friday, April 1, 1988 to other researchers and practitioners.

Sixth, research materials were purchased that would support this project's present and future activities. Reflex, Stats Plus, Boeing Graph, Express Graph, Insert, and Present It have been purchased and self-taught. Using these software packages allowed the project director to generate individualized profiles for dissemination to each of the survey respondents upon completion of their survey(s) in the Springs of 1987 and 1988. Each respondent received an individualized profile such as the mock-up shown in Appendix C, directions for interpretation, and a two-page bibliography. Additionally, and as detailed later, a "small project management" package was purchased; this package was used to organize the project activities in light of available resources (i.e., personnel, time, and physical resources) for the balance of the project. Also, machine-readable scoring forms were purchased and the surveys typeset and printed upon these forms (Note Appendix D). Thus project personnel have not had to keypunch the stress, role, and burnout data -- only the demographic data. This dramatically improved turnaround time between receipt of the surveys and completion of the analyses and reduced data processing costs.

Seventh, and as noted earlier, the timelines for the balance of the project were entered into SuperProject Plus, a computer scheduling program. Also included were start-, mid-, and completion-dates for each of the activities. This package was used to evaluate and prompt, in advance, program objectives related to timelines.

Eighth, the project budget was entered into Dac Easy Light, a computer accounting program. Though Appalachian State University has an "adequate" computerized system for tracking expenditures, the use of this redundant system allowed the Principal Investigator to more closely monitor purchases and other expenditures, and to do so on a more timely basis, during the second year of the Federally-funded project.

Ninth, the Principal Investigator has written and used the computer programs needed to statistically analyze the data during April and May of 1988 (note Appendix E) and, with the help of the Research Assistants, has not only cleared and coded a one-year backlog of data but also keypunched the additional two years of data. This information has been keypunched onto a master data file (note Appendix F), which allowed project personnel to conduct the

Table 1. Five Categories of Predictor and Criterion Variables

PREDICTOR VARIABLES			CRITERION VARIABLES	
Personal Variables	Academic Variables	Organizational Variables	Stress Variables	Burnout Variables
*Age	*High School Rank	*Student Number		*Total Burnout (Intensity)
*Sex	*Verbal SAT	*Site Satisfaction		
	*Math SAT	*Self-Reported Stress Level	*Total TSI (Strength)	
	*G.P.A.			
	*NTE			
	*Course Satisfaction	*Role Conflict		
	*Self-reported Course Stress	*Role Ambiguity		
		*Negative/Positive Views Towards Teaching		

Table 2. Research Questions Related to the Project Objectives

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01: Determine Variable Levels and Interrelationships

RQ1: To what extent are the personal, academic, organizational, role, performance, stress strength and frequency, and burnout variables experienced by teacher trainees and first-through fifth year teachers?

RQ2: To what degree are the personal, academic, organizational, role, performance, stress strength and frequency, and burnout variables interrelated to one another?

02: Determine Preprofessional and Professional Stress Predictors

RQ3: In what fashion and to what extent can the teacher trainee personal variables first, then the academic variables, and then the organizational, role, and performance variables predict teacher trainee stress strength keep levels?

RQ4: In what fashion and to what extent can the teacher personal variables first, then the academic variables, and then the organizational, role, and performance variables predict teacher stress strength keep levels?

03: Determine Preprofessional and Professional Predictors

RQ5: In what fashion and to what extent can the teacher trainee personal variables first, then the academic variables, the organizational, role and performance variables next, and the stress strength and frequency levels predict teacher trainee burnout levels?

RQ6: In what fashion and to what extent can the teacher personal variables first, then the academic variables, the organizational, role and performance variables next, and the stress strength and frequency levels predict teacher burnout levels?

04: Determine Longitudinal Variable Interrelationships

RQ7: In what fashion and to what extent can the teacher trainee personal variables first, then the academic variables, and the organizational, role, and performance variables next, predict future teacher stress strength levels?

RQ8: In what fashion and to what extent can the teacher trainee personal variables first, then the academic variables, the organizational, role, and performance variables next, and the stress strength and frequency levels predict teacher burnout levels?

RQ9: In what fashion and to what extent to the organizational, role, and performance variables, stress strength and frequency variables, and burnout strength variables change across four chronological levels of teacher traineeship and four of teacherhood?

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longitudinal analyses during late Spring, 1988. Since data collected from both preprofessional and professional levels were required for the analyses, subjects not providing data at both levels of observation were deleted from the analyses. The trimmed data list can be note in Appendix G.

Tenth, a new Digital Equipment Corporation VAX was installed at ASU, along with updated SPSS-X software, during the 1987-88 academic year. The advanced edit capabilities of the hardware and software vastly simplified the process of "cleaning up" the data files prior to the last analyses.

Table 3. Description of Project Activities

Project Activities (Activities 1-7)	Design for Evaluation of Objectives/Activities	Current Status of Objectives/Activities
1. Make decision to "go"		Completed 10/1/86.
2. Outline purpose/goals/ research questions, as outlined in this proposal.	An outline of the purpose, goals, and questions related to the project will be drafted when project proposal is written.	Completed 10/1/86.
3. Determine data needs as outlined in Berdie and Anderson (1974) and Orlich (1978).	An outline of the purpose, goals, and questions related to the project will be drafted when project proposal is written.	Completed 10/1/86.
4. State objectives outlined in this proposal.	An outline of the purpose, goals, and questions related to the project will be drafted when project proposal is written.	Completed 10/1/86.
5. Update related literature.	The literature related to teacher stress and burnout was updated during July, 1986, and will be done so every three months thereafter, for the life of the project.	Completed 10/1/86.
6. Obtain endorsements, instrumentation permissions;	Instrumentation permissions for the published scales have been purchased and obtained.	Completed 9/1/85.
7. Identify teacher trainee and teacher populations.	A list of teacher trainees and teachers is being generated from the ASU Department of Language, Reading, and Exceptionalities rosters.	Started 10/1/83; Ongoing until 6/30/90 Completed 10/1/87

Table 3 cont.

Project Activities (Activities 8-13)	Design for Evaluation of Objectives/Activities	Current Status of Objectives/Activities
8. Design sampling technique.	All special ed trainees are being contacted, as are all alumnae who have graduated since December, 1983.	Completed 10/1/86.
9. Complete sample list.	A list of teacher trainees and teachers has been generated and placed upon MultiMate Onfile, in order to generate mailing labels and lists, personalized letters, and to facilitate periodic updates of both student and alumnae addresses.	Started 10/1/83; Ongoing until 10/1/87 Completed 10/1/87
10. Develop final draft of survey battery on machine readable data forms.	Originals completed for duplication; were typeset by 9/1/86; were reproduced by 10/1/86	Completed 10/1/86
11. Prepare cover/ introduction letters.	Final forms of cover/introduction letters developed; revisions explaining machine readable surveys completed by 10/6/86.	Completed 7/1/86.
12. Distribute survey batteries to each ASU Special Education student during preprofessional training stage of development.	Survey batteries distributed. Machine readable version used 10/3/86	Started 10/1/83; Ongoing until 3/1/88 Complete 3/1/88
13. Mail follow-up survey batteries once annually to ASU teaching alumni	Survey batteries mailed.	Started 7/1/85; Continue 2/1/86, 2/1/87 and 2/1/88 Completed 2/1/88

Table 3 cont.

Project Activities (Activities 14-20)	Design for Evaluation of Objectives/Activities	Current Status of Objectives/Activities
14. Tabulate initial returns within four weeks of each distribution/mailing.	Initial returns tabulated.	Started 10/1/83; all data collected through 9/1/86 have been coded. Completed 3/1/88
15. Send follow-ups to non-returns as needed.	Letters and new surveys to non-respondents.	On-going, one month after each distribution/mailing through 10/1/89. Completed 10/1/87
16. Complete data coding, within eight weeks of each distribution/mailing.	All data coded.	On-going through 11/1/89. Completed 3/1/88
17. Write and "de-bug" SPSS Program file. a. Item level analyses b. Subscale-level analyses	File written and "de-bugged". Presently, the SPSS program files are being rewritten for SPSS-X, a newer and more powerful version.	a. Completed 12/1/83 b. Completed 10/1/85
18. Write statistical tests related to research questions 1 through 9.	Statistical Programs written and data files established. Statistical programs and data files remain unchanged.	Programs for the "one-shot" analyses completed 12/1/83; those related to time series analyses completed 12/1/85.
19. Complete statistical tests.	Completed upon generation of SPSS printout.	Ongoing; final analyses 3/22/88 completed 4/22/88.
20. Write final project report(s).	Completion of final project report(s).	Ongoing throughout 1987-88 academic year; completed 6/1/88.

Table 3 cont.

Project Activities (Activities 21-24)	Design for Evaluation of Objectives/Activities	Current Status of Objectives/Activities
21. Submit final report(s)	Final reports submitted.	Completed 8/15/88
22. Prepare summary articles based on RQs 1 through 9.	Articles completed for dissemination.	Completed 8/15/88
23. Submit articles to professional journals.	Articles submitted.	Completed 8/15/88
24. Disseminate information/ articles/presentations upon request.	Information/articles disseminated.	Completed 8/15/88

Appendix A

Articles about the project that have already been published

TESE, 1986, 9(1), 9-21

Variables Related to Stress and Burnout in Special Education Teacher Trainees and First-Year Teachers

Michael J. Fimian
Linda P. Blanton

ABSTRACT

This article reports on role, stress, and burnout problems experienced by 379 special education teacher trainees and 36 first-year teachers. Correlational analyses were used to determine the degree to which these were related to personal, academic, and organizational variables. Regression analyses were employed to establish how and to what degree these variables, in combination, acted as significant predictors of trainee and inexperienced teacher stress and burnout. Finally, analysis of variance was used to identify significant differences between and among three levels of traineeship and one of teaching, with respect to role, stress, and burnout problems in special education classrooms. Results indicated that the majority of such problems were significantly interrelated, that not all of the background variables predicted significant stress and burnout levels, and that different levels of role, stress, and burnout problems were observed in respondents at various stages of professional development.

Although teaching has long been thought stressful, little is known about the effects of classroom stress and teacher burnout on special education teacher trainees and inexperienced teachers (Duke, 1984). Limited data document the occurrence and annual fluctuation of stress and burnout or identify their possible antecedents. Moreover, few preservice or inservice teacher education programs include stress identification, burnout management, or role clarification interventions actually drawn from "real world" experiences.

Almost two decades ago, Fuller (1969) conceptualized teachers' stress-related concerns as a developmental progression, moving from a preteaching phase characterized by concern with self and one's adequacy to a later teaching phase concerned with students, their educational growth, and the teacher's instructional performance. Subsequent research revealed numerous sources of anxiety related to this progression, some of which have been verified in recent teacher stress and burnout investigations (Coates & Thoreson, 1976; Fimian, 1980, 1983). Unfortunately, preprofessionals have rarely been included in stress and burnout studies. When they were, it was observed that manageable stress levels were related to reduced role ambiguity resulting from accumulated teaching

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The investigators wish to acknowledge the following persons for their assistance in this project: the trainees and teachers who voluntarily contributed their time and data; Michael Holden, Jim Hosch, Betty Standish, Joe Shannon, Michael Ortiz, and Doris Jenkins for their assistance in the administration of the surveys; and Helen Keber, Carol Prewitt, Dianna D'Aurora, and William Krupicka for their coding and editorial assistance. This project was supported by U.S. Department of Education Grant No. G008302548, awarded to the second author.

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experience, a minimal degree of conflict related to one's role, and a smooth transition between the preprofessional and professional teaching stages (Coates & Thoreson, 1976). It was assumed that the more "talented" the trainee (as defined by scores on the Scholastic Aptitude Test [SAT] and National Teacher Exam [NTE], grade point averages, and other indicators), the better the preprofessional performance; and that better performance was somehow related to reduced teacher stress and burnout levels. Though such relationships have never been verified, it has been determined that the "best and brightest" are often the first to retire from education (Darling-Hammond, 1984; Schlechty & Vance, 1981) and that thousands leave special education each year (Teacher Education Division, CEC, 1982).

Recent research has begun to link teacher stress and burnout to numerous organizational, personal, and perceptual variables (Anderson, 1981; Fimian, in press; Schwab, 1981). Teachers in ambiguous or conflicting roles experience much more stress than those in more clearly defined or nonconflicting roles (Crane, 1981; Schwab, 1981). The majority of these investigations have also reported that teachers enter the profession with a certain amount of stress. It is often necessary, therefore, to account for the stress related to background factors before attributing stress to other variables.

Which environmental, personal, and organizational factors increase stress and burnout levels? The sources of these problems can be summarized into four categories of predictors: personal, academic, univariate organizational, and role organizational variables. A model displaying the assumed relationships among these variables is shown as Figure 1.

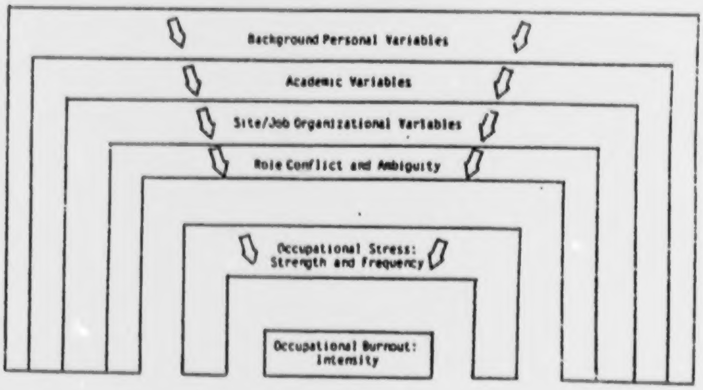
Personal variables such as the teacher's age and sex have been used to try to predict stress and burnout and have generally been found to explain a small though significant percentage of the variance associated with stress or burnout (Crane, 1981; Fimian, 1983; Schwab, 1981).

Since it is usually impossible to gather information regarding teachers' *academic background* in mailed surveys, there has been virtually no examination of the relationship of academic performance to trainee or teacher stress and burnout. Thus it has not been established whether good grades or high SAT or NTE scores correlate with an increased capacity for dealing with classroom problems, or with a greater sensitivity to them.

Univariate organizational variables such as teaching level, number of students, or type of site have been used in attempts to predict stress and burnout levels, though these, too, usually explain only a small percentage of the variance.

Role organizational variables are factors such as Role Conflict and Ambiguity. Role Conflict occurs, for example, when the information available to the teacher or trainee about his or her role is sufficient but conflicting. Incompatible demands or expectations from two or more supervisors, assignments for which the resources or skills to execute them are lacking, and the need to buck rules or policies are com-

FIGURE 1
Model of the potential relationships among the personal, academic, organizational, role, stress, and burnout variables.


Background Personal Variables
Academic Variables
Site/Job Organizational Variables
Role Conflict and Ambiguity
Occupational Stress: Strength and Frequency
Occupational Burnout: Intensity

mon Role Conflict situations (Rizzo, House, & Lirtzman, 1970). Role Ambiguity occurs when information is nonconflicting but insufficient to allow the individual to carry out assigned responsibilities adequately. A trainee might be unclear about particular teaching responsibilities, or procedures or goals may not have been articulated clearly enough to allow their being carried out (Rizzo et al., 1970). First proposed by Kahn, Wolfe, Quinn, Snoech, and Rosenthal (1964), both Role Conflict and Role Ambiguity have been shown to be significantly related to stress and burnout in support staff (Pierson & Archambault, 1982), special education teachers (Crane, 1981; McHardy, 1983), regular teachers (Schwab, 1981), and group home personnel (Fimian, 1984b). Little research has yet been conducted to investigate Role Conflict or Ambiguity levels among teacher trainee or first-year teachers, or to associate these with their stress or burnout levels.

The purposes of this study was to determine how personal, organizational, and role variables are interrelated and the degree to which they predict occupational stress and burnout in trainees and inexperienced (first-year) teachers, and to establish whether these problems are more prominent during traineeship or during first-year teaching. The study was designed to address these questions.

1. Are there interrelationships among the personal, academic, organizational, role, stress, and burnout variables?
2. What combination of personal, academic, organizational, and role variables significantly predicts the *frequency* of stress among trainees and inexperienced teachers?
3. Which of these variables, in combination, predict the *strength* of stress?
4. Which of these variables, in combination, predict the *intensity* of burnout?
5. Are any of the role, stress or burnout variables experienced to a greater or lesser degree at any point during traineeship or the first year of teaching?

METHOD

Samples

A total of 415 special education teacher trainees and first year teachers participated in the study. The teacher trainee group consisted of 379 students in their junior and senior years, each enrolled in one of three levels of required practica in Appalachian State University's (ASU) undergraduate special education program. The remaining 36 subjects were first-year teachers, all ASU alumnae teaching full-time within one year of graduation. All had completed the same sequence of classes, practica, and student teaching as that in which the trainees were enrolled. By levels of practicum, the teacher trainee sample included 116 pre-interns, 168 interns, and 95 student teachers. ASU's pre-internship, the first practicum experience, requires trainees to be in classrooms 2 mornings per week for 16 weeks. Interns, students in the second required practicum, are in classrooms 5 mornings per week for two successive placements of 8 weeks each. Both interns and pre-interns attend courses in the afternoons. The third placement, student teaching, is a full-time practicum of 16 weeks. Throughout this project, entrance and graduation criteria for the trainees, as well as coursework and practica, were held constant.

Instrumentation

A 19-item *Demographic Data Sheet* was used to obtain information about background variables, including respondent's age, sex, type of teaching site, teaching level, and number of students. Three other instruments were used to collect information about the variables of Role Conflict, Role Ambiguity, Teacher Stress, and Teacher Burnout. The *Role Questionnaire* (RQ) ascertained the degree of Role Conflict and Role Ambiguity existing in the job or placement (1 = *Definitely not true of my placement or job;* 7 = *Extremely true of my placement or job*). The RQ consists of 14 items: negatively stated items 1 through 8 assess Role Conflict; positively stated items 9 through 14 focus on Role Ambiguity. The factorial validity of these constructs was established earlier (Rizzo et al., 1970; Schuler, Aldag, & Brief, 1977) with split-half reliabilities approximating .90 for Role Ambiguity and .94 for Role Conflict (Keller, 1975).

The *Teacher Stress Inventory* (TSI) assesses the strength (1 = *No strength, not noticeable;* 5 = *Major strength, extremely noticeable*) and frequency (1 = *Never;* 7 = *Daily*) of stress experienced in 38 stressful events nested in six subscales: (a) Personal/Professional Stressors; (b) Professional Distress; (c) Discipline and Motivation; (d) Emotional Manifestations; (e) Biobehavioral Manifestations; and (f) Physiological-Fatigue Manifestations. The strength and frequency scores place the respondent along a continuum from "more" to "less" stressed. TSI construct and factorial validity were examined with six statewide teacher samples and yielded internal consistency reliability estimates of .90 to .95 (Fimian, 1983, 1984a, 1985; McHardy, 1983; Zacherman, 1984).

The *Maslach Burnout Inventory* (MBI), which assesses burnout in terms of 22 statements about attitudes, feelings, and perceptions of one's self and students, provides a relative measure of burnout (1 = *Very mild, somewhat noticeable;* 7 = *Major, very noticeable*) in terms of three subscales: (a) emotional exhaustion; (b) depersonalization; and (c) lack of personal accomplishment. Thus the individual is placed along a continuum from "more" to "less" burned out. MBI internal consistency reliability estimates ranged from .77 to .81 (Maslach & Jackson, 1981) and .75 to .90 (Iwanicki & Schwab, 1981).

Procedure

The four instruments were administered at the midpoint of each practicum and student teaching placement for trainees, and at the midpoint of the 1984–1985 school year for first-year teachers. These data were collected between October, 1983, and April, 1985. Surveys were completed in class by trainees; the teachers' surveys were distributed and followed up by mail. Of the 54 teacher surveys distributed, 36 (66%) were returned with complete data.

RESULTS

Variable Interrelationships

For Research Question 1, Pearson product-moment correlations were employed to determine the degree to which relationships exist between and among the variables. Multiple regression analyses were conducted to examine how and to what degree the academic, organizational, and role variables predict stress and burnout. These analyses only describe the nature and extent of the relationships among the variables, and do not address causal relationships.

With respect to the correlations summarized in Table 1, few significant relationships were found among the personal, academic, organizational, stress, and burnout variables. The role, stress, and burnout measures, however, were interrelated (r range = .27 to .66, p range = .05 to .001). GPA and NTE General and Area scores were not at all related to role, stress, or burnout. GPAs were positively related to both NTE scores (r range = .46 to .57, p = .001) but were not significantly related to SAT scores. Role problems were positively related to the strength and frequency of teacher stress (r range = .27 to .41, p range = .01 to .001) and the intensity of teacher burnout (r range = .31 to .42, p range = .01 to .001). Both strength and frequency of stress were significantly related to burnout (r = .46 and .63, p = .001).

Stress and Burnout Predictors

Stress frequency and stress strength predictors were determined in response to questions 2 and 3 and burnout predictors in response to question 4. The significance of the *F*-ratio is used to establish the degree of change of variance from step to step, and thus displays the significance of one or more predictors at their point of entry into the model. Finally, R^2, the estimate of the population squared multiple correlation coefficient based on the sample used, was determined as the last significant step for each of the regressions (Kerlinger & Pedhazur, 1973).

Predictors of stress frequency. For question 2, multiple linear regression analyses were conducted to determine the most parsimonious set of predictors of stress frequency, first for the trainees, then for the teachers, and finally for the total sample. As shown in Table 2, two to three variables other than the personal variables were found to be significant predictors of stress frequency for each group. When the variance for respondent sex and age was covaried for each of the samples (2% for each), the organizational and academic variables accounted for only a nonsignificant percentage of stress frequency. Role ambiguity and conflict, however, combined to explain 21% of stress frequency for the trainee and 22% for the total sample. For the teachers, only role conflict entered, but in itself explained 27% of the variance. Stress strength entered for each group at the final step, explaining an additional 26% of the stress frequency variance for trainees, 41% for the teachers, and 26% for the total sample. Overall, 49% of the variance associated with stress frequency for the trainee sample, 70% for the teacher sample, and 51% for the total sample was explained by the combination of personal, role, and stress strength variables.

Predictors of stress strength. Identical regression analyses were conducted to predict stress strength in response to question 3. As indicated

TABLE 1

Variable Intercorrelations

	Personal variables Age	Sex	Academic variables SAT (Verbal)	SAT (Math)	GPA	NTE (General)	NTE (Area)	Organizational variables Type of site	Teaching level	Number of students	Role variables Role conflict	Role ambiguity	Stress variables Total stress (Strength)	Total stress (Frequency)	Burnout variable Total burnout (Intensity)
Personal variables															
Age	—														
Sex	−30*[a]	—													
Academic variables															
SAT (Verbal)	−34*	11*	—												
SAT (Math)	−35*	07	93*	—											
GPA	06	−02	00	−06	—										
NTE (General)	10*	−03	−01	−04	46*	—									
NTE (Area)	12*	−07	07	03	57*	84*	—								
Organizational variables															
Type of site	−06	−05	−02	−04	12*	08	14*	—							
Teaching level	13*	−02	06	02	19*	13*	19*	16*	—						
Number of students	01	−05	08	08[b]	00	02	06	−07	19*	—					
Role variables															
Role conflict	−08[b]	07	−04	−04	02	02	01	05	12*	06	—				
Role ambiguity	−06	03	10*	−09[b]	06	−06	−06	05	−06	−05	43*	—			
Stress variables															
Total stress (strength)	−02	02	05	−09[b]	−07	−07	−03	05	00	−03	35*	27*	—		
Total stress (Frequency)	−10*	12*	08	03	00	00	01	00	02	04	41*	41*	66*	—	
Burnout variable															
Total burnout (Intensity)	−06	−07	07	05	05	−05	−05	08	02	03	31*	42*	46*	63*	—

* Significance meeting or exceeding the .05 level of probability.

[a] Decimals are omitted from all correlations.

[b] Trend-level relationship.

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TABLE 2

Stepwise multiple regression analyses for the relationships between predictor variables and total stress frequency

Step	Variable(s)	R	R^2	Increase in R^2	F^a
	Trainee sample (N = 379)				
1	Background variables[b]	.14	.02		3.76*
Academic variables[c]					
Organizational variables					
Role variables					
2	Role ambiguity	.42	.18	.16	72.19***
3	Role conflict	.48	.23	.05	26.28***
Stress variables					
4	Total stress strength	.70	.49	.26	193.34***
	First-Year Teachers (N = 36)				
1	Background variables[b]	.15	.02		0.36
Academic variables					
Organizational variables					
Role variables					
2	Role conflict	.54	.29	.27	12.09***
Stress variables					
3	Total stress strength	.84	.70	.41	42.93***
	Total sample (N = 415)				
1	Background variables[b]	.13	.02		3.75*
Academic variables					
Organizational variables					
Role variables					
2	Role ambiguity	.43	.18	.16	82.14***
3	Role conflict	.49	.24	.06	32.95***
Stress variables					
4	Total stress strength	.71	.51	.26	221.73***

* $p < .05$ **$p < .01$ ***$p < .001$

[a] Indicates significance of degree of change in R^2 from step to step

[b] Age and sex of respondent

[c] Variable categories without entries indicate that none of the variables entered as significant predictors of total stress frequency.

in Table 3, a number of the variables acted as significant predictors. After the background variables accounted for 0% to 3% of the construct, lower math SAT scores, or a combination of lower math and verbal SAT scores, explained a significant amount of stress strength variance for both the trainee (1%) and total (2%) samples, but were not significant for the teacher sample. None of the organizational variables entered at the next step. While role ambiguity had little impact upon stress strength (2% trainee and total samples), role conflict did have impact (10% for trainee, 46% for teacher, and 12% for total samples). Stress frequency then entered at the last step, explaining 30% of the stress strength variance for the trainee, 30% for the teacher, and 29% for the total sample. This combination of academic, role, and stress variables accounted for 43% of the trainees', 79% of the teachers', and 45% of the total sample's stress strength. Overall, a greater part of the trainees' stress frequency (49%) than stress strength (43%) was explained, while much larger percentages were evident for the teachers' stress strength (79%) and stress frequency (70%). About half of the stress constructs' variance (51% frequency, 45% strength) was explained in the total sample.

Finally, for question 5, a series of one-way ANOVAs was conducted in which the mean scores of each role, stress, and burnout subscale and scale were compared across levels of professional development. Means were computed first for the aggregate group of trainees vs. inexperienced teachers and then separately for the three trainee levels and the one teacher level. In comparisons in which two or more groups were considered, Scheffe's *post hoc* test was conducted to identify significant between-group differences.

TABLE 3

Stepwise multiple regression analyses for the relationships between predictor variables and total stress strength

Step	Variable(s)	R	R^2	Increase in R^2	F[a]
	Trainee sample (N = 379)				
1	Background variables[b]	.02	.00		0.09
Academic variables					
2	Math SAT	.12	.01	.01	4.92*
Organizational variables[c]					
Role variables					
3	Role conflict	.33	.11	.10	40.29**
4	Role ambiguity	.36	.13	.02	9.11**
Stress variables					
5	Total stress frequency	.66	.43	.30	194.30***
	First-Year Teachers (N = 36)				
1	Background variables[b]	.16	.03		0.45
Academic variables					
Organizational variables					
Role variables					
2	Role conflict	.70	.49	.46	28.78***
Stress variables					
3	Total stress frequency	.89	.79	.30	42.93***
	Total sample (N = 415)				
1	Background variables[b]	.02	.00		0.17
Academic variables					
2	Math SAT	.11	.01	.01	4.56*
3	Verbal SAT	.15	.02	.01	4.84*
Organizational variables					
Role variables					
4	Role Conflict	.38	.14	.12	55.87***
5	Role ambiguity	.40	.16	.02	9.25**
Stress variables					
6	Total stress frequency	.67	.45	.29	216.68***

* $p < .05$ ** $p < .01$ *** $p < .001$

[a] Indicates significance of degree of change in R^2 from step to step

[b] Age and sex of respondent

[c] Variable categories without entries indicate that none of the variables entered as significant predictors of total stress strength.

Predictors of burnout intensity. As shown in Table 4, variables similar to those explaining stress strength and frequency also explained burnout intensity. As before, background variables predicted a nonsignificant 1% of burnout for each of the three samples. Lower verbal SAT and general NTE scores then predicted a sizable 23% of the teachers' burnout construct. Organizational variables, as before, failed to explain any of the burnout variance. Role conflict and ambiguity contributed significantly to burnout for the trainee (18%) and total (20%) samples, while role ambiguity alone explained 31% of the teacher burnout. Finally, stress strength did not enter the model at all. While stress frequency accounted for a significant percentage of burnout for the trainee (25%) and total (24%) samples, it impacted less, though still significantly, upon burnout experienced by first-year teachers (14%). Overall, 44% of the burnout intensity variance for the trainee, 69% for the teacher, and 45% for the total sample was explained. These percentages approximate those found for the strength constructs and, as with those, a greater portion of the construct was explained for the teachers than for the trainees.

Group Differences

Item means and standard deviations. The stress means (Table 5) varied over ranges of 1.4 to 3.2 (strength) and 1.4 to 3.8 (frequency). These approximate mean scores were reported by other samples (Fimian, 1983, 1984a, 1985). The trainee and first-year teacher samples, therefore, experienced neither more nor less stress strength and stress frequency than have samples representing more experienced teachers. The trainees reported less stress related to

TABLE 4

Stepwise multiple regression analyses for the relationships between predictor variables and total burnout intensity

Step	Variable(s)	R	R^2	Increase in R^2	F[a]
	Trainee sample (N = 379)				
1	Background variables[b]	.11	.01		2.39
Academic variables[c]					
Organizational variables					
Role variables					
2	Role ambiguity	.42	.17	.16	72.91***
3	Role conflict	.44	.19	.02	7.83**
Stress variables					
4	Total stress frequency	.66	.44	.25	167.21***
	First-Year Teachers (N = 36)				
1	Background variables[b]	.11	.01		0.19
Academic variables					
2	Verbal SAT	.36	.13	.12	4.35*
3	General NTE	.49	.24	.11	4.36*
Organizational variables					
Role variables					
4	Role ambiguity	.74	.55	.31	20.58***
Stress variables					
5	Total stress frequency	.83	.69	.14	13.29***
	Total sample (N = 415)				
1	Background variables[b]	.11	.01		2.46
Academic variables					
Organizational variables					
Role variables					
2	Role ambiguity	.44	.19	.18	89.36***
3	Role conflict	.46	.21	.02	10.52***
Stress variables					
4	Total stress frequency	.67	.45	.24	180.01***

$^*p < .05$ $^{**}p < .01$ $^{***}p < .001$

[a] Indicates significance of degree of change in R^2 from step to step

[b] Age and sex of respondent

[c] Variable categories without entries indicate that none of the variables entered as significant predictors of Burnout Intensity.

stress sources, but more related to stress manifestations, than did more experienced teachers. These differences, however, were not significant. In comparison to the MBI norm group (Maslach & Jackson, 1981), both the trainees and the teachers scored in the lower third of the emotional exhaustion range, in the middle third of the depersonalization range, and in the lower end of the lack of personal accomplishment range. Thus, they reported experiencing significantly less emotional exhaustion and significantly more personal accomplishment than have previous samples.

As in the case of the TSI scores, all MBI scores ranged between the low moderate and moderate ranges. The trainee and teacher samples experienced role conflict and ambiguity only to a low moderate degree. In comparison to other teacher samples who have completed the RQ, both the trainees and the inexperienced teachers reported somewhat less role conflict and approximately the same degree of role ambiguity. Both samples reported less conflict than ambiguity.

When the stress, burnout, and role mean scores of the trainees were compared with those of the teachers, as noted in Table 5, there were apparent significant group differences. For example, the teachers reported significantly *stronger* stress levels related to personal/professional stressors and discipline and motivation, and significantly more *frequent* stress related to personal/professional stressors, professional distress, and discipline and motivation than did the trainees. Conversely, the teachers reported significantly *weaker* stress related to biobehavioral and physiological-fatigue manifestations than did the trainees. No significant differences were noted in terms of either burnout, its factors, or role ambiguity when the teachers were compared to the trainees. However, the teachers did report signifi-

TABLE 5

ANOVAs indicating stress, burnout, and role differences

	Aggregate D. Total trainees (*n* = 379) $\bar{x}$(SD)	Aggregate E. First-Year teachers (*n* = 36) $\bar{x}$(SD)	*F*	Individual groups A. Pre-Interns (*n* = 116) $\bar{x}$(SD)	Individual groups B. Interns (*n* = 168) $\bar{x}$(SD)	Individual groups C. Student teachers (*n* = 95) $\bar{x}$(SD)	Individual groups E. First-Year teachers (*n* = 36) $\bar{x}$(SD	*F*	Groups
				Occupational Stress: The Teacher Stress Inventory					
I. Personal/professional stressors									
Strength	2.7 (0.8)	3.0 (1.0)	5.3*	2.8 (0.8)	2.8 (0.8)	2.4 (0.8)	3.0 (1.0)	6.0***	3 vs 2, 4
Frequency	3.2 (1.1)	3.8 (1.5)	11.2***	3.3 (1.1)	3.2 (1.1)	3.0 (1.2)	3.8 (1.5)	5.4***	4 vs 2, 3
II. Professional distress									
Strength	2.3 (0.6)	2.5 (0.6)	2.2	2.3 (0.6)	2.5 (0.5)	2.2 (0.6)	2.5 (0.6)	4.9**	2 vs 3
Frequency	2.9 (0.9)	3.2 (1.0)	4.0*	2.9 (1.0)	3.0 (0.9)	2.7 (0.9)	3.2 (1.0)	4.2**	3 vs 2, 4
III. Discipline and motivation									
Strength	2.7 (0.9)	3.2 (1.0)	11.6***	2.5 (1.0)	2.7 (0.9)	2.8 (0.9)	3.2 (1.0)	6.0***	4 vs 1, 2
Frequency	3.1 (1.3)	3.8 (1.6)	10.9***	2.9 (1.3)	3.2 (1.3)	3.4 (1.2)	3.8 (1.6)	6.8***	1 vs 3, 4 2 vs 4
IV. Emotional manifestations									
Strength	2.8 (1.1)	2.4 (0.9)	3.2	2.9 (1.1)	2.9 (1.1)	2.6 (1.1)	2.4 (0.9)	3.6	
Frequency	3.4 (1.4)	3.0 (1.3)	1.6	3.4 (1.4)	3.5 (1.4)	2.9 (1.3)	3.0 (1.3)	4.4**	2 vs 3
V. Biobehavioral manifestations									
Strength	1.8 (1.1)	1.4 (0.8)	4.7*	1.8 (1.0)	1.9 (1.1)	1.7 (1.1)	1.4 (0.8)	2.2	
Frequency	1.7 (0.8)	1.4 (0.5)	2.5	1.7 (0.7)	1.7 (0.9)	1.5 (0.7)	1.4 (0.5)	2.3	
VI. Physiological-fatigue manifestations									
Strength	2.4 (1.0)	2.0 (1.0)	4.3*	2.3 (1.0)	2.5 (1.1)	2.2 (1.0)	2.0 (1.0)	2.7	
Frequency	2.5 (1.2)	2.2 (1.1)	2.4	2.5 (1.1)	2.7 (1.3)	2.3 (1.0)	2.2 (1.1)	3.0	
Total Strength	2.4 (0.7)	2.4 (0.6)	0.0	2.4 (0.6)	2.5 (0.7)	2.3 (0.7)	2.4 (0.6)	2.4	
Total Frequency	2.8 (0.8)	2.8 (0.9)	1.3	2.8 (0.7)	2.9 (0.8)	2.6 (0.7)	2.8 (0.9)	2.6	
				Occupational burnout: The Maslach Burnout Inventory					
I. Emotional exhaustion	2.4 (1.0)	2.5 (1.3)	0.1	2.4 (1.0)	2.4 (1.0)	2.3 (1.0)	2.5 (1.3)	0.5	
II. Depersonalization	1.7 (0.8)	1.7 (0.9)	0.1	1.4 (0.6)	1.7 (0.9)	1.7 (0.7)	1.7 (0.9)	2.3	
III. Lack of personal accomplishment	3.0 (0.9)	2.8 (1.1)	1.2	3.0 (0.9)	3.1 (0.9)	2.7 (0.9)	2.8 (1.1)	5.6***	3 vs 2
Total Burnout	2.3 (0.7)	2.3 (0.9)	0.1	2.3 (0.6)	2.4 (0.7)	2.2 (0.7)	2.3 (0.9)	2.3	
				Role stress: The Role Questionnaire					
I. Role conflict	2.2 (1.0)	2.8 (1.3)	10.5***	1.9 (0.9)	2.3 (1.1)	2.1 (0.8)	2.8 (1.3)	6.3***	4 vs 1, 3
II. Role ambiguity	3.1 (1.1)	3.2 (1.2)	0.0	3.3 (1.0)	3.3 (1.2)	2.6 (0.9)	3.2 (1.2)	8.4***	3 vs 1, 2

$^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

df = 1/411

df = 3/409

Strength ratings based on a 5 point scale: 1 = No strength, not noticeable; 5 = Major strength, extremely noticeable.

Frequency ratings based on a 7-point scale: 1 = Never, 7 = Every day

Burnout ratings based on a 7 point scale: 1 = Very mild, barely noticeable; 7 = very strong, extremely noticeable.

Role ratings based on a 7 point scale: 1 = Definitely not true of my job; 7 = Extremely true of my job.

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cantly more role conflict associated with their new positions than did the trainees. Evidently, entering the "real world" of teaching neither increases nor reduces the ambiguity related to one's role, but does place one in more conflict.

When the samples were reanalyzed in terms of professional development (i.e., across three levels of traineeship and one of teaching), some group means were significantly different from one another, primarily with respect to stress source and role variables. Student teachers, for example, reported significantly less frequent and significantly weaker professional distress than did the intern or teacher groups. The teachers reported significantly more frequent bouts with personal/professional stressors than did the interns and student teachers, and significantly stronger discipline and motivation problems than did the pre-interns and interns. Pre-interns and interns experienced significantly less frequent discipline and motivation problems than did the student teachers and teachers. Interns, however, reported significantly more frequent emotional manifestations but significantly less personal accomplishment than did the student teachers. The teachers reported significantly stronger role conflict than did the trainees, but about the same degree of role ambiguity. Student teachers experienced the least ambiguity, and did so significantly less often than did the pre-interns and interns.

DISCUSSION

It is apparent that inexperienced teachers and trainees are subject to no more, but no less, stress than that typically encountered by experienced teachers. The sample reported more problems with stress manifestations than with stress sources, a pattern which contradicts that typically found among experienced professionals (Fimian, 1983, 1984a, 1985). Why this is so is not clear. Perhaps part of becoming and being a professional entails learning how to cope with the ways in which stress manifests itself, and to do so before professional stress sources become pronounced. An alternate hypothesis is that one's problems and priorities change upon graduation and entrance into the "real world" of teaching. This is partially confirmed in that the first-year teachers reported significantly stronger stress sources (i.e., professional distress and discipline and motivation problems) and experienced them significantly more often than did the teacher trainees. The trainees, on the other hand, reported significantly stronger manifestations (i.e., biobehavioral and physiological-fatigue manifestations) than did the teachers.

Whereas the progression from preprofessional to professional appears to be marked by shifting patterns of stress, there are few differences with respect to burnout or role ambiguity —these occur neither more nor less frequently than they do in more experienced teachers (Crane, 1981; Schwab, 1981). This transition is, however, marked by a dramatic increase in role conflict, as evidenced by the finding that first-year teachers reported on-the-job conflict significantly more often than did trainees. On a more heartening note, the respondents experienced much less burnout-related emotional exhaustion and significantly more personal accomplishment than has typically been reported by more experienced teachers and human service workers (Maslach & Jackson, 1981). Not surprisingly, this finding can best be attributed to the "freshness" that is evident when one enters a profession or embarks upon a career. The respondents also reported moderate levels of role conflict and ambiguity, with somewhat less role conflict and approximately the same degree of ambiguity as that reportedly encountered by more experienced professionals (Crane, 1981; Schwab, 1981). Thus "learning the ropes" appears to be an ongoing process, continuing at least through the first few teaching years.

An examination of the background variables lends support to the concept that role, stress, and burnout problems are more a function of teachers' perceptions of the teaching environment than they are of the individual. Apparently the respondent's age, sex, verbal and analytical ability, academic achievement level, performance on teacher tests, type or level of site, and number of students served have little to do with role, stress, or burnout levels. The degree to which the individual perceives role, stress, or burnout problems as actually occurring, however, is significantly related to the perceived relevance, strength, frequency, and intensity of these problems.

The search for a parsimonious set of predictors of stress and burnout yielded similar results. The personal, academic, and organizational variables rarely acted as predictors, while the respondents' perceptions of their work world did. Except for the teachers, neither SAT or NTE scores, type of site, teaching level, nor number of students played a significant role in predicting stress strength, stress frequency, or burnout intensity. Finally, the degree to which respondents experienced role conflict and ambiguity significantly predicted stress strength and frequency and burnout intensity.

Results for first-year teachers were similar in that the personal and organizational variables predicted little of the stress or burnout levels. The verbal SAT scores did predict burnout intensity, but neither they nor the other academic variables predicted stress strength or frequency. High levels of role conflict were found to predict stress strength and frequency, but not burnout intensity. Conversely, high role ambiguity levels predicted burnout intensity, but neither stress strength nor frequency. Once the background variance was explained, it was apparent that high stress frequency predicted strong levels of stress and vice versa. However, only stress frequency, not stress strength, predicted burnout intensity. Thus, those inexperienced professionals dealing with role ambiguity are more apt to experience burnout, while those coping with role conflict situations are more likely to experience strong stress levels, and to do so very often. Those encountering stress frequently were more likely to experience significantly stronger stress and more intense burnout than those teachers experiencing stress infrequently. Though practitioners have little control over the strength of perceived stress of their practicum students, they can attempt to control the frequency with which stressful events occur in practicum settings. Doing so may have an ameliorating effect on the degree of burnout incurred by the trainees.

It was apparent that, except in rare instances, the personal, academic, and organizational variables did not predict stress strength, stress frequency, or burnout intensity. Only for stress strength did lower SAT scores act as significant predictors. Apparently, those with weaker SAT performances are also those who experience stronger stress when teaching. Finally, those experiencing the strongest levels of role conflict and ambiguity are also those who deal with the strongest, most frequent, and most intense stress and burnout. Admittedly, such results are to be considered preliminary insofar as the sample is limited to one university, one geographical region, and one 3-year time period. Future comparisons of results with trainees and inexperienced teachers from other teacher training institutions and other geographical regions, and across longer periods, are needed to verify these relationships.

RECOMMENDATIONS FOR TEACHER EDUCATION

The findings suggest a number of recommendations for both preservice and inservice programs. First, teacher educators should be directly instructing—not just warning, but also showing, exposing, and simultaneously supporting—would-be teachers about the realities of what it is like to be "out there" in the schools. To accomplish this, teacher training programs must view themselves as being among the chief agents for promoting change in new teachers' behaviors and perceptions. Failure to instruct about the realities would reflect a basic psychological resistance to negative thinking —a phenomenon Matlin and Stang (1978) have termed the "Pollyanna Principle." Acquainting prospective teachers with the realities of the teaching world prior to graduation will allow them to identify stress situations and to generate appropriate adaptive responses. This "preparedness," or the psychological training that will help teachers anticipate stressful situations, would assist trainees in dealing with uncertain futures and unhappy eventualities such as failure. To do so could undercut anxiety, restore motivation, clarify priorities, increase risk taking, and shift attention from future-oriented coping to living creatively in the present (Fimian, 1980).

Training programs investing in this type of change would need to include proactive stress and burnout identification and management practices at more than the lecture level alone. Actively teaching and practicing person-change techniques (e.g., meditation, relaxation, exercise, diet, nutrition, and other well-being practices) during practica would develop adaptive habits early in the professional career. During the first few teaching years, other methods of preventing or reducing stress (e.g., group problem solving, professional support groups, interpersonal skill training, person potential groups, professional counseling, and if need be, career change) can be better entertained. Regardless of the timing, the adoption of an intervention would necessitate development of certain basic skills: collecting information about one's self and the job, analyzing the information, setting goals and developing plans for change, monitoring and evaluating progress, modifying the plan as necessary, and, if need be, recycling the process.

System-change strategies, too, can be used to lessen the negative impact of the real world upon trainees and inexperienced teachers. Providing more visible peer and supervisory support during the crucial developmental years is one method of reducing stress to manageable levels (Fimian, in press). Another is rearranging the work or practicum environment to reduce "caught in the middle" conflict situations. To do so would necessitate decreasing the frequency with which school staff must do things which they feel should be done differently; work on unnecessary projects; receive assignments without adequate resources, support, or materials to execute them; work with groups who operate quite differently than does the individual; or receive incompatible requests.

Although numerous models are currently being developed and implemented to provide support systems for new teachers, it is critical that they address the conflict situations in which teachers often find themselves. In addition, methods should be developed for teachers to use in resolving conflict during the crucial first years of teaching. Only when we are concerned enough to prioritize survivability in our training programs will we produce teachers who can respond similarly for and to students. As Young (1978) aptly phrased it, "...to nurture humaness in school means first to nurture humaneness in those who staff the schools" (p. 83).

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Research note

Stress, burnout, and role problems among teacher trainees and first-year teachers

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INTRODUCTION

Though the relationship between human service worker stress and the workplace has been explored for over half a decade (Cherniss, 1980), it has only recently been speculated that teaching, too, can be stressful — particularly during the first few years in the profession. Some estimate that as many as 20 per cent of all new teachers leave education during the first few years (Duke, 1984). Many of these may also be the best and brightest (Schlechty and Vance, 1981). These projections contribute significantly to the estimated 30,000 special education teachers who 'drop out' of the classroom annually (*TED*, 1982). As noted in the RAND report, teacher loss is a growing and very real concern (Darling-Hammond, 1984). Simply focusing on teacher retention may not provide answers to these concerns, however. The more central issue, instead, may be the development of specific teacher characteristics during the formative stages of pre-professional and early professional development — some of which could lead to a state of stress or burnout. Most would agree that the teacher's mental health and personality as reflected by his or her classroom behaviours, perceptions, and attitudes, are important factors in determining whether one stays on the job. Whether this is actually the case, though, has yet to be documented. In part, this is due to the lack of operational definitions for both stress and burnout.

Most practitioners work with *a priori* definitions of stress and burnout, while an increasing number of researchers are employing psychometrically defined constructs. These data-based constructs have the advantages of being tested across numbers of teacher groups and teaching situations and of being compared with or related to already-established classroom factors. Two such models are the Teacher Stress Inventory (Fimian, 1984, 1985a, b) and the Maslach Burnout Inventory (Maslach and Jackson, 1981; Iwanicki and Schwab, 1981). Research using these scales has associated teacher stress and burnout with variables such as role problems, locus of control, perceived need deficiencies, lack of administrative and peer support, and other personal and professional variables and percepts (Anderson, 1981; Fimian, 1985b; Schwab, 1980).

Although the literature is replete with descriptions of the problems faced by

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experienced teachers, very little is known about whether these or similar problems are encountered by inexperienced teachers and teacher trainees. Ellis and Mathews (1982) and Duke (1984) noted that the ambiguous, insecure, and conflicting roles of pre-professionals could set the stage for teacher dissatisfaction, poor performance, attrition, and higher stress and burnout levels. While these concerns were the impetus for a number of research projects which investigated the relationship between 'mental health' and 'teacher anxiety' (Coates and Thoreson, 1976), these earlier investigations tended to use different terminology, were repetitive, and were not based on coherent theoretical frameworks and well-defined variables.

The numerous questions concerning the development of stress, burnout and role problems among teacher trainees and beginning teachers resulted in four research questions:

RQ1. Do patterns of stress, burnout, and role problems of teacher trainees and inexperienced teachers exist and, if so, do they parallel those of experienced teachers?

RQ2. Can both the original and/or the derived stress factors be used in a valid and reliable fashion?

RQ3. Can the stress, burnout, and role factors derived from prior research be used to reliably assess teacher trainee and inexperienced teacher problems?

RQ4. Are the stress, burnout, and role factors related to each other?

METHOD

Sample/procedure

The sample totaled 413 pre-professional trainees and first-year special education teachers. The pre-professional group included 115 Appalachian State University (ASU) pre-interns, 165 interns, 95 student teachers, and 38 first-year teachers. Respondent data were collected once at the midpoint of each pre-intern, two successive internship, and one student teaching placements, and again at the midpoint of the 1984–1985 teaching year. Entrance and graduation criteria for the trainees were held constant. A 93-item survey packet was used to assess numerous variables between October 1983 and April 1985. Packets were completed in class by the trainees. Those completed by teachers were distributed by mail and followed up in the same fashion, resulting in a 66 per cent return.

Instrumentation

The first set of 19 questions in the survey packet addressed personal background variables, including respondent age, sex, type of site, level of teaching, views towards teaching, receipt of support from peers and/or supervisors, and degree of course and placement satisfaction. Also included in the packet were three instruments. The *Role Questionnaire* (RQ) ascertains the degree of role conflict and role ambiguity existing in one's job or placement (1 = definitely not true of my placement/job; 7 = extremely true of my placement/job). The validity of these constructs was established earlier using factor analyses (Rizzo, House and Lirtzman, 1970; Schuler, Aldag and Brief, 1977). Split-half reliabilities approximated 0.90 (role ambiguity) and 0.94 (role conflict; Keller, 1975).

The *Teacher Stress Inventory* (TSI) assesses stress in terms of both the strength (1 = no strength, not noticeable; 5 = major strength, extremely noticeable) and the frequency

(1=never; 7=daily) of 38 stressful events nested in six subscales: (a) personal/professional stressors; (b) professional distress; (c) discipline and motivation; (d) emotional manifestations; (e) biobehavioural manifestations; and (f) physiological-fatigue manifestations. Both strength and frequency scores place the respondent on a continuum of 'more' to 'less stressed'. TSI construct validity was examined and alpha reliabilities of 0.90 to 0.95 were established (Fimian, 1984, 1985a; McHardy, 1982; Zacherman, 1984).

The *Maslach Burnout Inventory* (MBI) assesses work-related burnout with 22 statements about attitudes, feelings, and perceptions of self and students. The MBI provides a relative measure of burnout (1 = Very mild, somewhat noticeable; 7 = Major, very noticeable) in terms of three subscales: (a) emotional exhaustion; (b) depersonalization; and (c) lack of personal accomplishment. The MBI alpha reliabilities range from 0.77 to 0.81 (Maslach and Jackson, 1981) and 0.75 to 0.90 (Iwanicki and Schwab, 1981).

Statistical procedures

Statistical procedures using SPSS were conducted during Spring 1985. For RQ1, to determine the presence or absence of role, stress, and burnout factors in trainees and inexperienced teachers, principal components factor analyses followed by oblique and varimax rotations were conducted, first using stress, then burnout, and finally role data. For the TSI strength and frequency dimensions, items with component loadings exceeding 0.30 for both dimensions were retained. Then, the MBI intensity data and the RQ relevancy data were entered into separate factor analyses.

For RQ2, addressing the degree of internal consistency within factors, coefficient alpha or internal consistency reliability formula was used (Cronbach, 1951) to determine the alpha reliability of each derived factor and scale. In response to RQ3, and since this was the first time these variables had been used to assess trainees and inexperienced teachers, the alpha reliabilities of the original TSI factors were inspected. Finally, and in response to RQ4, the original factors derived from previous teacher research were correlated with one another.

RESULTS

Factorial validity

The factorial validities of the TSI, MBI and RQ were examined based on principal components factor analyses. Table 1 contains the retained and abbreviated item stems with the component loadings derived from oblique rotations for both the TSI strength and frequency data drawn from the teacher trainees. Item-factor correlations ranged from 0.30 to 0.81 for the strength dimension and from 0.30 to 0.76 for the frequency. All were significant. Four identical factors for each of the strength and frequency dimensions resulted, based on two ratings for each of 32 items. It was evident that: (a) four factors explained the construct of teacher trainee stress; (b) little variability existed among the patterns between dimensions; (c) six items relevant to teacher stress, but which did not meet the aforementioned inclusion criteria, were deleted; (d) the trainees experienced fewer stress factors than do teachers; and (e) the items clustered in similar, though fewer, factors than are typically evident in teachers.

Table 1. TSI abbreviated item stems, component loadings, and alpha estimates for the four-factor stress solution

Item no.	Abbreviated item stem	Strength component loadings	Frequency component loadings
Factor I.	Classroom stress *(Strength alpha = 0.82; Frequency alpha = 0.80)†		
1	Pace of day is too fast	47‡	49‡
15	Too big a class	48	45
16	Too much work to do	43	48
29	Too much paperwork on job	50	43
31	No opportunity to progress	46	43
5	Having to constantly monitor pupils	75	67
6	Discipline problems in the classroom	75	67
19	Dealing with inadequate discipline policies	70	54
20	Authority rejected by students or staff	69	60
34	Teaching students who would do better if they would try harder	60	66
33	Teaching poorly motivated students	57	64
Factor II.	Professional distress (alphas = 0.50, 0.50)		
17	Need for enhanced status and respect	73	66
32	Attitudes and opinions remain unheard	66	58
2	Lack of emotional stimulation	62	58
Factor III.	Emotional-fatigue manifestations (alphas = 0.91, 0.89)		
43	Feeling anxious	77	54
44	Feeling unable to cope	76	75
50	Feeling insecure	84	88
51	Feeling vulnerable	66	80
56	Feeling depressed	79	76
48	Procrastinating	50	59
49	Rapidly physically fatigued	84	77
55	Physical weakness	48	59
60	Sleeping more than usual	41	58
61	Physically exhausted	66	65
Factor IV.	Biobehavioural manifestations (alphas = 0.92, 0.82)		
45	Use of over-the-counter drugs	90	55
52	Use of prescription drugs	88	62
54	Rapid/shallow breath	74	54
47	Increased blood pressure	75	59
59	Pounding heart	61	43
46	Stomach cramps	74	73
53	Stomach pain of extended duration	82	75
58	Stomach acid	82	75
	Total stress score (alphas = 0.92, 0.89)		

* Factors have been ordered in terms of final placement on the revised TSI (trainee form), and not in terms of explained variance.

† Alphas are reported for the strength dimension first, the frequency dimension second.

‡ Decimals have been omitted from component loadings—loadings of 0.30 or above are reported.

Table 2 presents the factorial data for the burnout and role constructs. All items for both scales were retained. Item-factor correlations ranged from 0.34 to 0.74 for the burnout items and from 0.23 to 0.75 for the role items. All were significant. With respect to the MBI, a three-component solution almost identical to that found in experienced teachers was derived. Only in the case of items 16 (working with students strains me) and 6 (working with people strains me) did the items not load on anticipated factors. Typically, these associate with emotional exhaustion; in this case, they were related more to depersonalization. Also in Table 2 are the factorial data for the role constructs. For the RQ, a distinct two-component solution identical to that found in teachers was evident. All items loaded on anticipated factors, indicating a clear distinction between role conflict and role ambiguity.

Internal consistency reliability

Table 2 contains the alpha reliability estimates for each derived MBI and RQ subscale and scale, first for the trainees and then for the teachers. With respect to the

Table 2. MBI and RQ abbreviated item stems, component loadings, and alpha estimates for the burnout and role problem solutions

Item no.[*]	Abbreviated item stem	Component loading
Maslach Burnout Inventory[*]		
Factor I.	Emotional exhaustion (alpha = 0.86 trainees, 0.91 teachers)	
1	Feel emotionally drained	84[†]
2	Feel used up	82
8	Feel burned out	78
3	Feel tired early in day	77
20	Feel at end of rope	60
14	Feel am working too hard	49
13	Feel frustrated	47
16	Working with students strains me	[‡]
6	Working with people strains me	[§]
Factor II.	Depersonalization (alpha = 0.67 trainees, 0.77 teachers)	
5	Treat others impersonally	69
11	Teaching hardens me emotionally	65
15	Don't really care what happens at work	61
10	Am becoming callous	60
22	Students blame me for their problems	53
Factor III.	Lack of personal accomplishment (alpha = 0.75 trainees, 0.87 teachers)	
7	Don't deal well with problems	72
17	Don't make relaxed teaching atmosphere	69
9	Am not positively influencing others	68
19	Not accomplishing anything	65
4	Don't understand how pupils feel	63
21	Don't deal well with emotional problems	50
18	Don't feel exhilarated at work	48
12	Don't feel energetic	30
Total burnout	score (alpha = 0.76 trainees, 0.88 teachers)	

Item no.	Abbreviated item stem	Component loading
Role Questionnaire[‖]		
Factor I.	Role conflict (alpha =0.76 trainees, 0.88 teachers)	
7	Receive incompatible requests	70
1	Have to do things that should be done differently	67
8	Things I do are accepted by one supervisor but not the others	67
6	Have to occasionally buck rules or policy	66
2	Have to do unnecessary work	66
3	Receive assignments without necessary support	56
4	Receive assignments without necessary resources	49
5	Work with two groups who do things differently	49
Factor II.	Role ambiguity (alpha =0.89 trainees, 0.94 teachers)	
13	Don't know all of my responsibilities	86
14	Need clearer explanations of what to do	84
11	Don't have clearly-articulated goals	79
9	Not sure of what is expected of me	75
10	Don't know extent of my authority in the classroom	70
12	Not sure I divided my time properly	63

[*] MBI ratings are based on the following scale: (1) very mild, barely noticeable; (4) moderate; (7) very strong, extremely noticeable.

[†] Decimals are omitted; component loadings are ordered highest to lowest within factors.

[‡] Item 16 loaded 0.58 on depersonalization subscale.

[§] Item 6 loaded 0.53 on depersonalization subscale.

[‖] RQ ratings are based on the following scale: (1) definitely not true of my job or placement; (7) extremely true of my job or placement.

stress factors derived from the trainee sample, subscale reliability estimates ranged from 0.50 to 0.92. Overall, stress strength factor and scale reliabilities proved somewhat higher than did those for the frequency factors and scale. Reliabilities for the 32-item trainee scale were 0.92 (strength) and 0.89 (frequency). Similar results were also apparent when the reliability of the original TSI factors were determined. With a low of 0.36 and a high of 0.90 for trainees' subscales and 0.35 to 0.89 for teachers', the reliabilities for the teachers, except in a couple of instances, proved equal to or slightly larger than the trainees'. Estimates related to the stress sources were generally lower than those of the manifestations for both groups. Over 89 per cent of the reliabilities exceeded the 0.60 level — the point at which group comparisons are possible — and whole-scale alphas ranged from 0.89 to 0.93 for both groups. Thus, whole-scale alphas were approximately the same for both the original and derived versions of the TSI.

With respect to the MBI and RQ, alpha magnitudes approximating the TSI's were evident. With a trainee alpha range of 0.67 to 0.86 and a teacher range of 0.77 to 0.91 on the MBI subscales, it was apparent that the MBI was more reliable for the teachers than it was for the trainees. Similarly, whole-scale alphas of 0.85 and 0.93 were evident for the trainees and teachers. This pattern was apparent with the role variables as well. Trainees reported 0.76 and 0.89 estimates for the role conflict and ambiguity variables, respectively, while teachers reported 0.89 and 0.94.

Scale/subscale intercorrelations

The correlational data indicate that low to moderate positive correlations exist between the majority of the stress and burnout, stress and role, and burnout and role variables. Less than 4 per cent of all possible intercorrelations fell in either the trend or nonsignificant range, with the majority exceeding the 0.001 level of significance. Total stress strength was significantly correlated with total stress frequency ($r = 0.66$), role conflict ($r = 0.36$), role ambiguity ($r = 0.27$), and total burnout ($r = 0.47$). Total stress frequency was significantly related to role conflict ($r = 0.41$), role ambiguity ($r = 0.42$), and total burnout ($r = 0.64$). Role conflict and ambiguity were significantly correlated to one another ($r = 0.43$) and to total burnout ($rs = 0.32$ and 0.43, respectively). It was apparent that role conflict and ambiguity were related more strongly to stress than they were to burnout, but that stress and burnout were even more strongly correlated.

DISCUSSION

A number of interpretable factors are evident which operationally define the construct of stress as perceived by inexperienced professionals and trainees. When compared with more experienced teachers, trainees and first-year teachers express fewer item-level concerns. Additionally, a number of the stress factors combine, yielding a smaller number of interpretable factors for inexperienced teachers and trainees than is the case in more experienced teachers. These factors, nonetheless, are similar to those evidenced in experienced teacher populations. It is possible, therefore, to defend the use of either the 32-item or 38-item TSI with trainees and inexperienced teachers, as long as caution is used when interpreting scores derived for the stress source factors. For the trainees, some of the items from professional distress and personal/professional stressors combined with discipline and motivation to form the classroom stress factor. Also, the subfactors that comprise the original physiological-fatigue factor did not combine in this instance. Instead, the gastronomic component combined with biobehavioural manifestations while the fatigue component combined with emotional manifestations.

The shorter form of the TSI has the advantages of fewer items to score and fewer factors to report, but has the disadvantage of not being able to compare trainees to teachers directly. In terms of the future use of the inventory, however, it is clear that additional work will need to be conducted involving a number of the stress factors. Conceptually similar items having a bearing on stressful events experienced by trainees could be added to the TSI in future field tests.

The MBI and the RQ factors proved adequate for use in making group comparisons. It was apparent also that the burnout and role problems evidenced by less experienced teachers and trainees are almost identical to those reported by teachers (Fimian, 1984, 1985a). Only two of the burnout and none of the role items loaded on unanticipated factors, and alpha reliability estimates reached adequate enough levels to warrant the use of these factors in making group comparisons.

Once the stress, burnout, and role factors were clearly defined, correlational analyses among these factors indicated strong interrelationships among them. Those trainees and inexperienced teachers encountering role problems to the greatest extent were also those under the most stress, under stress the most often, and were at greatest risk of burnout of those who were surveyed.

Progress in the field of mental health, as in other areas of science and service, depends upon the researcher's and practitioner's capacity to understand, explain, predict, and control phenomena of interest. In educational settings there is mounting concern about the stressful events that occur in the teaching environment, particularly in light of the number of professionals who leave the field each year. While researchers have gained some understanding of the types of stress experienced during the trainee and initial levels of professional development, these inquiries have often been hampered by the sometimes ill-defined nature of the mental health concepts that have been widely used. Clearly, a better understanding of the role, stress and burnout problems encountered on the job, and during training, are necessary to develop usable conceptual models, especially if we are to resolve some of the problems which occur in the schools.

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Appendix B

Article manuscripts about the project that have been submitted but not yet published

A LONGITUDINAL ANALYSIS OF VARIABLES RELATED TO SPECIAL EDUCATION TRAINEE AND TEACHER STRESS AND BURNOUT

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Running Head: LONGITUDINAL STRESS ANALYSIS

Abstract

This investigation explored the longitudinal growth and development of stress and burnout among 358 special education trainees and 357 first-through-fourth year teachers across five years. Personal, academic, organizational, and role variables that could, with time, result in higher-than-average stress and burnout levels are also examined. These concerns were investigated as the special education teacher trainees progressed through three levels of preprofessional development (i.e., pre-internship placement; internship; and student teaching) and four of professional development (i.e., first through fourth years of teaching). In so doing, the concurrent and predictive interrelationships among role conflict, role ambiguity, stress strength, and burnout intensity were examined.

A LONGITUDINAL ANALYSIS OF VARIABLES RELATED TO SPECIAL EDUCATION TRAINEE AND TEACHER STRESS AND BURNOUT

There presently exists a growing interest in teacher stress and burnout. In-class teacher mental health has been discussed exclusively in the literature, but only a limited amount of research has actually been conducted. During the early 1980's interest in teacher stress burgeoned (Fimian, 1980; Greenberg & Vellututti, 1980; Truch, 1980). With the exception of a limited number of articles and dissertations, what has not been produced are data-based studies that would verify and describe the parameters of the phenomena known as teacher stress and burnout, or the variables that contribute to elevated stress or burnout levels across different stages of professional development. The research that has been conducted has been of a "one-shot" basis. Only one recent article addressed the subject of longitudinal teacher stress and burnout research, and this merely suggested that it needed to be conducted (Farber, 1984). At a time when professionals are seeking answers as to why teachers are leaving education, few have actually been investigating the reasons why so many people choose this option.

It has been speculated that teaching can be stressful, particularly during the first few years of professional life. Some estimates place first-year teacher mortality in excess of 25% and that, for one reason or another, as many as twenty percent of all beginning teachers will leave education during their first few teaching years (Duke, 1984). Additionally, there is evidence that the best and brightest teachers leave the earliest (Schlechty & Vance, 1981). Overall, this contributes significantly to the estimated 30,000 special education teachers who annually "drop out" of the classroom (TED, 1982). Teacher retention may not be the primary issue, however. Most would agree that both the teacher's "personality" and "mental health", as reflected in classroom behaviors, perceptions, and attitudes are important. Of concern, therefore, would be those teachers who not only "retire" after a few years of teaching, but who also remain in the classroom for an additional decade and a half. Unfortunately, the development of job-related attitudes, perceptions, and behaviors during the preprofessional and early professional stages of development -- some of which could lead to the problem of stress and burnout -- have not yet been documented.

The measurement of stress and burnout. Currently, there are no universally accepted definitions for teacher stress or burnout. In fact, the terms are often used interchangeably. Maslach and Jackson (1981), who has provided the most widely used definition of burnout, noted that researchers have one set of definitions while the media and practitioners in education have others. Those teachers subjected to stress and not familiar with its numerous definitions usually recognize its presence in the form of "a negative tension or annoyance caused by something at work, at home, or on the road in between" (Greenberg & Valletutti, 1980, p. 2). Those at risk of burnout often report experiences with mental and physical exhaustion, or attitudes and work activities that have become increasingly depersonalized. The thrust of stress and burnout research since 1980 has been to first operationally define these subjective impressions and experiences and to then associate them with the objective events that occur in the work place. Accordingly, numerous definitions for both stress and burnout have resulted, often independently of one another.

Most "definitions" of stress and burnout are actually descriptions of relationships between the subjective impressions and the objective experiences of the individual who is stressed or burned out. The majority of these definitions are based on preconceived conceptual categories supported by limited observations, case studies, and counseling referrals. Some, however, are based on large-scale survey results, and a smaller number have even been developed psychometrically from this research. Most practitioners work with conceptual definitions of stress and burnout, therefore, while many researchers have increasingly employed operationally and psychometrically defined constructs. These data-based constructs or "models" of stress and burnout have the advantage of being invariably tested across different teacher groups and teaching situations, and this can be compared with already-established classroom factors.

To confound matters, the majority of teacher stress studies have been based on an ex post facto survey model of information gathering. Kerlinger (1973) noted that this type of study collects information about events, experiences, or attitudes during or after the occurrence of particular phenomena. Since the actual nature and prevalence of classroom stress and burnout had not been determined by the late 1970's, the obvious first steps were to operationally define the constructs, develop related measures, field test these, refine the constructs, and then use the instruments to survey different teacher groups. Only a few investigators, however, actually conducted this time-consuming process (Maslach & Jackson, 1981; Fimian, 1982a, 1988; Iwanicki & Schwab, 1981; McHardy, 1982; Cichon & Koff, 1981; Styles & Cavanagh, 1977) while numerous others have developed "models" of stress or burnout without testing their worth in terms of content and construct validity or reliability. Progress in the field of mental health, as in other areas of science, depends upon the researcher's and practitioner's capacity to understand, explain, predict, and control phenomena of interest. While researchers have gained some understanding of different problems in school settings, the inquiries concerning teacher stress and burnout have been hampered by the abstract and often ill-defined nature of the mental health concepts widely used during the 1970's. Such conceptualizations have spawned competing theoretical frameworks and a number of conceptual models and "interventions," few of which have been empirically tested or verified.

Teacher stress and burnout. The increasing concern about maintaining and improving teachers' mental health within the school setting comes as no surprise. There are a number of valid reasons for examining further the stress-related mental health problems of teachers. The first is the human and financial costs of stress-related disorders. A decade ago, the Department of Labor, in compiling statistics about the American work force, determined the loss in capital gains at around $245 billion for stress-related problems, $15.9 billion for hypertension-related problems, $20.3 billion for cigarette smoking related illnesses, and another $33.6 billion for alcohol abuse (Bensky, 1980). Though these costs may reflect those actually spent in education, it is safe to assume that the proportionally smaller financial losses are still quite costly, and that the effects upon students can be incalculable. Indeed, the 1979 survey of the American Academy of Family Physicians indicated that teachers and secretaries ranked second in the percent of respondents per occupation experiencing significant work stress. In the same year, 84% of the 7,000 respondents in a survey conducted by Instructor magazine believed that there were health hazards in teaching. They estimated that 33% of their own absences yearly were stress-related. Classroom observers were also noting a seeming shift in priorities from increasing "what students learn" to "surviving because of tension" in the schools (Fuller, 1968).

By the 1980's educational researchers began to link stress and burnout among educators with variables such as role stress, locus of control, perceived need deficiencies, lack of administrative and peer support, as well as other select personal and professional variables and percepts (Schwab, 1980; Anderson, 1981; Pierson, 1983; Fimian; 1985). Teacher groups -- special education teachers, for instance -- began to be considered on a separate basis (Crane, 1981; Fimian, 1982; McIntyre, 1982). A few studies even began to examine the prevalence and intensity of stress and burnout for members of supportive service groups (Pierson, 1983). What rapidly became clear is that certain teachers -- those who fill roles that are ambiguous or conflicting -- experience significantly stronger stress than do those whose roles were neither ambiguous nor conflicting (Crane, 1982; Schwab, 1980). This also is particularly true for special education teacher trainees and even more so for new teachers (Fimian & Blanton, 1986, 1987). Dealing with conflicting or ill-defined job situations apparently, increases significantly the chances of experiencing higher-than-average stress and burnout levels. Additionally, these investigations also established that teachers, whether they be male or female or in regular or special education, each bring a certain "amount" of stress to the job. The present challenge is to account for the "background" relationships first and the stress levels related to variables that "belong" to the organization next.

Trainee stress and burnout. Much has also been written about the problems that could result in stress and burnout in beginning teachers, as expansively overviewed by Veenman (1984). Few investigators, however, have actually explored these problems, the human and professional costs that may eventually be involved, or the link between these problems and stress and burnout. Duke (1984) noted that the ambiguous, insecure, and conflicting roles that many preprofessionals take on in their training could set the stage for future teacher dissatisfaction, poor performance, attrition, and higher stress and burnout levels. Such concerns earlier led to a limited number of research projects that investigated the relationship between "mental health" and "teacher anxiety" (Coates & Thoreson, 1976). Unfortunately, these studies tended to be isolated, to use different terminology, to be repetitive, and to miss opportunities to capitalize on previous findings in the absence of a coherent theoretical framework (Kearney & Sinclair, 1978). This dependence on a "one shot" survey methodology and poorly articulated definitions of "anxiety" further limited the types and nature of the findings. And, though some (e.g., Fuller, 1969) have proposed that teaching anxiety starts during the preprofessional years, increases during the beginning years, and then decreases later, no attempt had been made to establish this.

Despite these limitations, it was evident that certain concerns do change from the preprofessional through the professional years, as do stress and "anxiety" levels. In the late 1960's, for example, Fuller (1969) conceptualized the stress-related concerns of teachers as a developmental progression: the preteaching phase by concerns with self and self-adequacy, and the later-teaching phase by concerns with students and their educational growth and with teaching performance. Subsequent research -- focused primarily on beginning and experienced teachers -- established numerous sources of anxiety related to this progression. Some of these have been verified in the teacher stress and burnout research, and some have not (Coates & Thoreson, 1976; Fimian, 1982a). No attempt, however, has been as yet made to study this development on a longitudinal basis. Apparently and understandably so, using a "cross sectional" or "single shot" methodology has proven to be the more expedient route than mounting long-term investigations. In addition, preprofessionals were rarely included in these studies. When they were, preprofessional anxiety was usually correlated with supervisory observations of trainee anxiety, but with little else. It was apparent, however, that reduced role ambiguity as a result of accumulated teaching experience, a minimal degree of conflict related to one's role, and a smooth transition from the preprofessional to professional stages of teaching were each related to manageable stress and anxiety levels (Coates & Thoreson, 1976). Though it is often assumed that a) the more "talented" the preprofessional (as defined by SAT and NTE scores, GPAs and other indicators) the better the preprofessional performance, and that b) this better performance leads to reduced professional stress and burnout levels, these relationships have never been verified. On the other hand, it has been established that the "best and the brightest" are often the first to leave education (Darling-Hammond, 1984; Schlechty & Vance, 1981). Are these attrition rates and patterns due in part to stress and burnout during the beginning years? Unfortunately, no data exist that would support or refute such a relationship to date.

The Variables Under Study

What environmental, personal, and organizational factors heighten stress and burnout levels? The sources of stress and burnout are numerous, and can be summarized in one or more of three different categories of predictor variables, as done so in Figure 1 and Table 1. Each of these have been discussed in the teacher stress literature, though few have actually been investigated using a database provided by experienced teachers; fewer still are based on trainees.

Predictor Variables

Personal variables such as the teacher's age and sex, as noted in Table 1, have been used in a number of data-based studies in order to predict teacher stress and burnout. These have been found to statistically "explain" a significant, though small, percentage of the variance associated with the stress or burnout constructs (Anderson, 1981; Crane, 1981; Fimian, 1982a; Schwab, 1980). Since the contribution of personal characteristics to stress or burnout has been somewhat limited, they generally are used to covary a certain amount of stress or burnout variation _prior_ to the entry of other variables into the explanatory model. Also, when this type of analysis has been conducted, it has been done so for experienced teachers -- and not trainees.

Since much of the research has been conducted with experienced teachers through the postal service, it has also been impossible to gather information regarding the teachers' _academic variables_. Only one earlier report determined the extent to and fashion in which academic performance is related to teacher/trainee stress and burnout. This contribution, at best, appears to be minimal. _Univariate organizational variables_ such as student number, the various types of teacher supervisory styles, work or placement site satisfaction, and self-reported stress levels have each been used to predict stress and burnout. As in the case of the personal variables, though, these organizational variables explain a significant, though small, percentage of the stress and burnout variance. For this reason, these variables usually act as covariates to initially explain or "control for" some of the variance associated with the constructs in question, prior to entering other variables into the explanatory statistical model.

Usually, and once these organizational variables have been accounted for, _role organizational variables_ are then entered into the explanatory model, as noted in Figure 1 (Anderson, 1981; Crane, 1981; Schwab, 1980). Such variables are typically related to problems with one's role -- i.e., Role Conflict and Role Ambiguity. Role Conflict occurs when the information that is available to the teacher trainee about his or her role is sufficient but conflicting. Incompatible demands or expectations from two or more supervisors, receiving assignments without the resources or skills to execute them, and having to buck rules or policies are each common Role Conflict situations (Rizzo, House, & Lirtzman, 1970). First proposed by Kahn, et. al. (1964), Role Conflict has been related to stress and burnout in school support professionals (Pierson and Archambault, 1983), special education and gifted teachers (Crane, 1982; McHardy, 1982), special classroom teachers (Anderson, 1981; Schwab, 1980) and group home personnel (Fimian, 1984b). Little or not work related to role conflict and stress has yet been conducted with teacher trainees.

Insert Table 1 and Figure 1 about here

Role Ambiguity occurs when the individual has nonconflicting but insufficient information to adequately carry out assigned responsibilities. It may be that the trainee is unclear about particular teacher responsibilities, or perhaps procedures or particular goals have not been articulated clearly enough that would help the trainee associate today's activities with tomorrow's outcomes (Rizzo, et. al., 1970). Role Ambiguity has been significantly related to high stress or burnout levels in school support staff (Pierson & Archambault, 1983), special education and gifted teachers (Crane, 1982, McHardy, 1982), regular classroom teachers (Anderson, 1981; Schwab, 1980) and group home personnel (Fimian, 1984b). Again, little or no research has been conducted that would investigate Role Ambiguity levels of teacher trainees, or that would associate these with stress or burnout.

Individually and in combination, the personal, academic, organizational and role variables listed in Table 2 will be used to predict stress and burnout levels.

Criterion Variables

Two sets of criterion variables will also be investigated: stress and burnout. Teacher stress is defined in terms of the Teacher Stress Inventory (TSI; Fimian, 1988), variations of which have assessed stress levels in teachers of the mentally retarded (Fimian, 1983), special education and gifted teachers (Fimian & Santoro, 1983, McHardy, 1982), special, regular, and mainstream education teachers (Fimian, 1982), and group home personnel (Fimian, 1984b). The TSI yields one stress strength score for each of seven stress factors, and one Total Stress Score.

Teacher Burnout, the end result of long-term intense or frequent bouts with stress, has also been variably defined. The most-frequented burnout model has been that defined in terms of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981). This scale has been used with public school personnel (Schwab, 1980; Anderson, 1981; Crane, 1981; Pierson & Archambault, 1983), doctors, nurses, lawyers, and policemen (Maslach & Jackson, 1981), and group home personnel (Fimian, 1984b). Though the MBI yields highly correlated intensity and frequency measures, only the intensity scale was used in this study.

In order to more clearly understand this initial growth and development, or the maladaptive forms of it, it was necessary to address a number of questions. First, do stress levels vary across levels of preprofessional development (i.e., pre-intern, intern, and student teaching) and early professional development (i.e., first-through-fourth years of professional experience)? And, are these stress/burnout levels at all related to certain personal, academic, organizational or role variables? Information derived from "one shot" studies, unfortunately, often proves more limited than that of a longitudinal perspective. Do stress and burnout levels vary from year to year through both preprofessional and early professional stages of growth? Do role problems vary from year to year? Do the antecedent variables or "sources" of stress and burnout affect stress and burnout levels from year to year? Do preprofessional stress, burnout, and role problems predict later professional stress, burnout, and role problems? This investigation addresses each concern.

METHOD

Sample

A sample of 101 pre-interns, 126 interns, 131 student teachers, 120 first year teachers, 92 second year teachers, 68 third year teachers, and 69 fourth year teachers, for a total of 715 respondents, were surveyed between October, 1983, and February, 1988. Each Appalachian State University (ASU) undergraduate special education teacher trainee from the Department of Language, Reading, and Exceptionalities' rosters were surveyed once during pre-intern placement, once during intern placement, once during student teaching, and once each for four successive follow-up years. Thus, some respondents were surveyed three times (e.g., three preprofessional) while others were surveyed as many as seven (e.g., three preprofessional and four professional). Three chronological levels of teacher traineeship (i.e., pre-internship, internship, and student teaching) and four chronological levels of teacher-hood (i.e., first, second, third, and fourth teaching years) were investigated. The sample, though limited in both terms of size and geographical distribution, nevertheless presented a unique research opportunity. Being the primary teacher-trainee program for bachelor-level teachers in North Carolina, ASU generates over half of the special education teachers who currently teach in the state and, to a lesser extent, the Southeastern United States.

Research Design

The cross-sectional research design employed is that of a multiple group with staggered and continuous single treatment. Like other quasi-experimental designs, the following time-series design offers an adequate substitute for nonfeasible true experimental designs (Huck, Cormier, & Bounds, 1974). In order to survey each of four graduating classes of ASU teacher trainees, the following plan was used:

1984 Graduates	O1	O2	O3	X	O4	O5	O6	O7
1985 Graduates		O1	O2	O3	X	O4	O5	O6
1986 Graduates			O1	O2	O3	X	O4	O5
1987 Graduates				O1	O2	O3	X	O4
1988 Pre-graduates					O1	O2	O3	X

where O_1 (pre-intern measure), O_2 (intern measure), and O_3 (student teaching measure) represent the use of the same dependent variables (i.e., role, stress and burnout) throughout the preprofessional stage of development; "X" represents graduation; O_4 (first t.y. or teaching year), O_5 (second t.y.), O_6 (third t.y.), and O_7 (fourth t.y.) represent the use of the same measures to assess the same variables (e.g.

roles, stress and burnout) throughout the early professional stage of development. Assumably, the "continuous single treatment" consists of the history, growth, and experiences during the last three semesters of traineeship and the first four years of contact with the "real world" of teaching. The staggered aspect of the design is requisite, due to the staggered/successive nature of the respondent pool.

Variables

Independent variables. The independent variables are defined as either personal, academic, or organizational variables. As outlined in Table 1, *personal background variables* included each respondent's age, sex, and when appropriate, education level. Background *academic variables* include each respondent's high school rank, verbal and math SAT scores, ASU GPA, NTE General and Area scores and self-reported course satisfaction and course stress levels. *Organizational variables* for trainees include self-reported satisfaction with, and stress levels related to, each particular placement and, for both teachers and trainees, student number and negative or positive views towards teaching. Information about each of the background variables was collected either on a survey battery cover sheet or by searching respondents' academic records. Surveys mailed to teachers were identical to those distributed to teacher trainees, except for course- or placement-related questions, which were not used with the teachers.

Dependent variables. The dependent variables are defined as the strength of teacher stress, and the intensity of teacher burnout occur during each of the training sites and the first four years of teaching.

Independent variables. The independent variables were used to predict each set of role, stress, and burnout variables; then the independent and role variables were used to predict stress and burnout; finally, the independent, role, and stress variables were used to predict burnout.

Respondent Confidentiality

The confidentiality of trainee and teacher respondents was assured via the use of code numbers. No trainees or teachers were identified by name. Subsequent to the dissemination of results, all trainee and teacher lists were destroyed.

Instrumentation

Three valid and reliable instruments were used to collect information about four of the variables under investigation: role conflict and role ambiguity, the strength of stress, and the intensity of burnout.

The Role Questionnaire. The Role Questionnaire (RQ; note Schwab, 1981) ascertains the degree of Role Conflict and Role Ambiguity (1 = Definitely Not True of My Job; 7 = Extremely True of My Job) that exists in one's job or placement. The RQ consists of 14 items: negatively-stated items (1 through 8) assess Role Conflict; positively-stated items (9 through 14) focus on Role Ambiguity. The validity of these constructs was determined based on a number of factor analyses (Rizzo, et. al., 1970; Schuler, Aldag, & Brief, 1975). Split-half reliabilities approximated .90 for Role Ambiguity and .94 for Role Conflict. Alpha reliabilities of .85 for Role Conflict were established by Pierson (1981).

The Teacher Stress Inventory. The Teacher Stress Inventory (TSI; Fimian, 1988) assesses stress in terms of the strength (1 = No Strength, Not Noticeable; 5 = Major Strength, Extremely Noticeable) of 49 stressful events nested in seven subscales: (a) Professional Distress; (b) Discipline and Motivation; (c) Time Management; (d) Emotional Manifestations; and (e) Behavioral Manifestations; (f) Physiological Manifestations; and (g) Fatigue Manifestations. The strength subscale scores are summed to develop the Total Stress Strength Score. From this score the respondent is not designated as being "under stress" or "not under stress;" instead, he or she is placed on a continuum of "more" to "less stressed." TSI construct validity was examined based on eight statewide samples of teachers and factor analyses that employed oblique and varimax rotations. Based on these factors, internal consistency reliability estimates of .90 to .98 were established (Fimian, 1982, 1984, 1985, 1988; McHardy, 1982; Zacherman, 1982).

The Maslach Burnout Inventory. The Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986), also entitled the "Survey of Professional Occupations," assesses occupational burnout in terms of 22 statements about respondents' attitudes, feelings, and perceptions of one's self and students. The MBI provides a relative measure of burnout (1 = Very Mild, Somewhat Noticeable; 7 = Major, Very Noticeable) in terms of three subscales: (a) Emotional Exhaustion; (b) Depersonalization; and (c) Lack of Personal Accomplishment. The MBI was developed using factor analyses based on samples of human service professionals. From these scores, the individual is not designated as "burned out" or "not burned out"; instead he or she is placed on a continuum of "more" to "less burned out." The internal consistency reliability estimates of the MBI's subscales range from .77 to .81 (Maslach & Jackson, 1981) and .75 to .90 (Iwanicki & Schwab, 1981).

Statistical Procedures

A number of statistical procedures were used to analyze the data collected in the course of this project. First, the SPSS-X frequencies program was used to determine the degree to which the organizational, stress, burnout, and role variables were experienced by the three levels of trainees and four of teachers.

The second emphasis of the study was to examine the relationship of

Role Ambiguity and Role Conflict with trainee stress and burnout, after controlling for variance attributable to the background personal and academic variables. SPSS-X multiple regression analyses were used to do so. This allows for the examination of the relationship(s) between two or more independent variables (e.g., numerous organizational variables) and a dependent variable (e.g., stress) while covarying for the effects of potentially confounding variables (e.g., sex and age). Multiple regression analysis were used only to describe the nature and extent of the relationships between the criterion and predictor variables, and not to demonstrate causal relationships among these. To do so, all background categorical variables were first blocked and entered into the analysis. Then, the predictor variables were similarly blocked and entered into the model in a stepwise fashion. This allowed the predictor which accounts for the most variance in the criterion to enter first, and subsequent predictors to enter if they accounted for additional variance. By entering the background variables in the first step and then following with the academic, organizational and role predictor variables, the optimal amount of variance of the stress and burnout constructs can be determined. Similar analyses were conducted to determine stress and burnout predictors. In these latter regressions, stress was included as a role and organizational predictor of burnout at the final step.

Results

A number of results were apparent. Due to the scope of the project and the volume of data to report, pertinent findings are included in this article in abbreviated fashion; doing so allows for a thorough, albeit somewhat superficial, overview of the project. These findings are linked to particular questions, each of which was related to one or more of the statistical analyses.

Variable Means

An inspection of the variable mean scores reported for Role Conflict and Role Ambiguity (note Table 2), stress sources (note Table 3), stress manifestations and total stress (note Table 4), and for each of the burnout variables (note Table 5) indicates that these problems are experienced by the group, and on the average, at moderate levels.

Insert Tables 2, 3, 4, and 5 about here

What were the role, stress and burnout levels across years?

As noted in Tables 2 through 5, Role Ambiguity and Role Conflict were both rated as being problematic -- particularly in the case of Role Ambiguity. The stress factors Time Management and the burnout factor Lack of Personal Accomplishment were also rated highly. Generally, the stress sources were scored at higher levels than were the stress manifestations variables, as indicated by the mean scores in Tables 3 and 4. Approximately the same levels of stress and burnout were experienced from year to year though in some cases, there were significant differences across time in some variables. Burnout levels tended to increase from annually, primarily due to increasing levels of Emotional Exhaustion and growing feelings of a Lack of Personal Accomplishment.

Do Role Conflict and Role Ambiguity levels change with time? Is one variable more prominent than the other?

As apparent in Table 2, both Role Conflict and Role Ambiguity levels increase with time, but Role Ambiguity changes much more so than does Role

Conflict, increasing dramatically from teaching year to teaching year. Overall, Role Ambiguity levels were much higher than were Role Conflict Levels for each year of teaching.

What were the mean scores for the stress sources? Did they vary with time?

All source of stress scores fell in the low- to mid-range, as noted in Table 3. Time Management, which at first was the strongest of the stress sources, tended to decrease with time. Nonetheless, it still remained about the strongest. Conversely, Personal-Professional Stressors, Discipline and Motivation, and Professional Distress tended to increase with time.

What were the stress manifestations scores for the strength dimension? Did they vary with time?

As with the stress sources, all the stress manifestations scores fell in the low- to mid-range. Emotional Manifestations and Biobehavioral Manifestations tended to decrease with time, yet the lowest levels of Emotional Manifestations approximated the highest ratings for the other two manifestation factors; Physiological-Fatigue Manifestations varied somewhat, but tended more than the others to remain about the same from year to year. Overall, emotional problems, then physiological and fatigue problems, and finally biobehavioral problems were ranked strongest to weakest.

Did the strength of total teacher stress across time change across years?

As with the stress sources and manifestations subscale scores, the Total Stress Strength Scores fell in the low to moderate range of the 5-point rating scale, indicating that the majority of the trainees and teachers experienced only moderate amounts of stress across across time. As evident in Table 4, the stress strength ratings were highest during the college years -- particularly during the internship. During the first three teaching years stress levels fell then jumped dramatically during the fourth teaching year. These last stress levels, nonetheless, did not reach the magnitude of stress strength experienced during the training years.

What were the Maslach Burnout Inventory mean scores? Did they change with time?

The scores for the three MBI subscales and the total burnout scale fell in the low-moderate range, though there was some differences with respect to the way in which the teachers responded differentially to the various burnout variables. As noted in Table 5, Depersonalization not only stayed at about the same levels across time but was also the least intense of the burnout factors. Emotional Exhaustion tended to vary in magnitude across time, and fell mid-range of the three burnout subscales. The Lack of Personal Accomplishment was the highest of all the burnout subscales, and increased from year to year. From this profile, it is apparent that these teachers felt little need to depersonalize their students in order to deal with them, yet experienced moderate levels of Emotional Exhaustion. Most disturbing, though, was the finding that as time progressed, these same teachers felt less and less that they were accomplishing anything worthwhile on the job.

Did the overall burnout intensity increase with time?

The data presented in Table 5 indicate that the Total Burnout Score, as with the subscale scores, fell in the low-to-moderate burnout range; burnout intensity was lowest for the college level surveys and increased steadily every year after that. Despite the fact that stress levels stayed approximately the same across time, this particular sample of teachers was becoming more burned out as time progressed. Of the training level evaluations, the internship level was once again rated the highest and student teaching the lowest. At the teaching level, the fourth and final year of teaching was reported to be the highest.

Burnout Prediction

A number of multiple linear regression analyses were then conducted to determine the fashion in and extent to which the personal, professional, role problem, and stress variables predicted Total Burnout. The first set of regressions inspected "within years" variables only; the second identified predictors from previous years that would predict significant percentages of the variance associated with the Total Burnout Score.

What within-years variables predicted the largest percentage of the burnout variation? Were any variables better than others in terms of burnout prediction?

Personal, high school, and college variables did little to predict burnout, predicting at the most about 4% of the construct; even then, this rarely occurred. Next, site and other classroom variables such as caseload size were entered into the model, accounting for little if any of the burnout variation. Next, Role Ambiguity and Role Conflict predicted significant burnout levels at each year of comparison. Finally, stress strength predicted additional significant levels of burnout within years. From the data in Table 6, it was apparent that who the teacher was, how well they fared in high school, and how well the did in college and on the NTE had little bearing on presently-experienced burnout levels. What did make a significant difference in terms of the presently-experience burnout were the stress and role problems that were concurrently experienced. Role Conflict, Role Ambiguity and stress strength each contributed significantly to elevated burnout levels.

When predicting within years, burnout how much of the burnout construct was actually explained? Did this percentage change across the years?

The same variables as previously -- role problems and stress strength -- predicted ever-increasing amounts of the burnout construct per year, as evidenced in Table 6. Overall, about 50% of the construct was explained, with a low of 30% explained in the internship level of traineeship to 63% explained during the fourth year of teaching. The predictor variables generally accounted for greater percentage of variance during the teaching years than it did during the training years.

Insert Table 6 about here

Do prior-experienced stress and role problems contribute to presently-experienced burnout?

At the first step of the regression analysis, and as noted in Table 7, prior personal, high school, and college variables predicted little of the burnout construct. When they did, only 3% to 9% of the burnout variance was actually experienced. At the next step though, prior experienced role problems predicted significant levels of burnout, did so for the majority of the teaching years, but did so less and less each year. Similarly, when the stress strength was entered at the next and last step of the regression model, it was apparent that it did contribute to presently-experienced burnout levels, did so increasingly through college and into the first year of teaching, but leveled off and contributed about the same from year to year thereafter.

Insert Table 7 about here

To what extent do prior teaching experiences predict presently-experienced burnout, across years? What percentage of the burnout construct is explained, remains unexplained?

As noted in Table 7, from 8% to 30% of the presently-experienced burnout construct is explained per year by the role problems and stress strengths experienced in the past. As with the within-years predicted amounts which increase from year to year, the across-years percentages of the burnout construct that is predicted increases from year to year. The percentage of explained burnout increase through the training observations, dips slightly during the first and second year of teaching, and then increases dramatically from the third to fourth teaching year. Relatively speaking, the total percentages of prior-years predictions (note Table 7) are much smaller than those reported for the within years predictions (note Table 6). These comparisons indicate that prior or "residual" role and stress problems do indeed contribute to a significant degree to presently experienced burnout, and do so more and more as the teachers continue to teach. Much more of presently-experienced burnout is related to those problems that the teachers were currently coping with, however.

Discussion

As with any study based on data that show relative standings of the membership of a given group, there is some "good new" and there is some "bad news." The good news is that the group, on the average, experienced only low-to-moderate levels of stress and burnout problems, with slightly more elevated problems related to role problems. The examination of the distributions, however, indicates that a number of teachers from this particular group reported extremely high stress and burnout levels. Across time, stress strengths stayed stable, but number of the burnout scores tended to increase. Also, Role Conflict and Role Ambiguity increased with time -- particularly Role Ambiguity. This indicates that the more ambiguous characteristics of the job -- not knowing exactly what is to be cone as roles shift and change, for example -- increase significantly from year to year.

With respect to burnout predictors, it was apparent that what gender the teacher was, how much experience they had, how well he or she did in high school, college and on the NTEs had little bearing on presently experienced stress and burnout problems. Role problems experienced "today" and to a lesser extent, those experienced in recent years, appeared to result in elevated stress and burnout levels. Stress strengths, too, in addition to role problems, predicted significant burnout levels. As in the case of role problems, the stress experienced "today" lent itself most to making teachers "at risk" of burnout; the stressful experiences of prior years, predicted somewhat less of the burnout construct.

Though these results may seem somewhat "common sense" in the fact of what is known about occupation role problems, stress and burnout, this study nonetheless verifies the common sense role for the first time. To date, no stress and burnout study of a longitudinal nature has been conducted in the United States, surveying American teachers about what they are experiencing on the job. Doing so more frequently would allow us to more thoroughly understand the stressful experiences that occur in teaching that could, with time lead even new teachers to a perceptual and emotional state of burnout.

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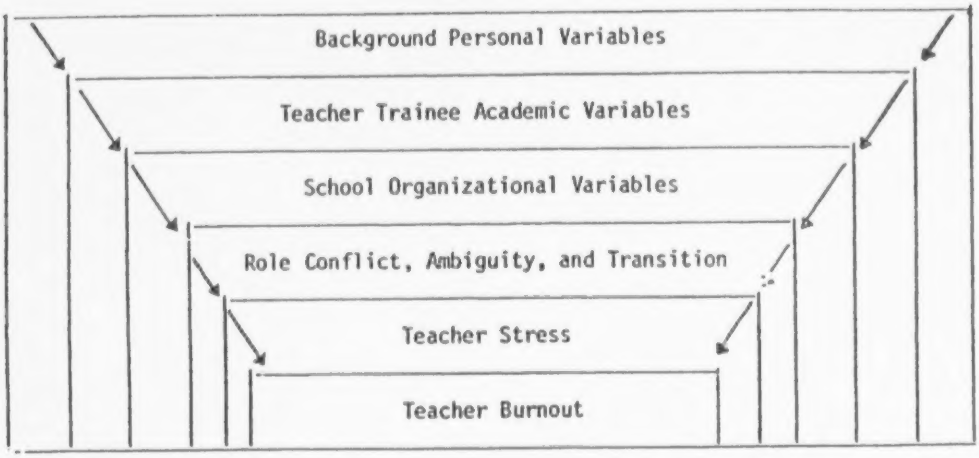
Background Personal Variables
Teacher Trainee Academic Variables
School Organizational Variables
Role Conflict, Ambiguity, and Transition
Teacher Stress
Teacher Burnout

Figure 1. Model of the relationships among teacher classroom stress and burnout, role and school organizational variables, and teacher trainee academic and background personal variables.

Table 1. Five Categories of Predictor and Criterion Variables

PREDICTOR VARIABLES			CRITERION VARIABLES	
Personal Variables	Academic Variables	Organizational Variables	Stress Variables	Burnout Variables
*Age	*High School Rank	*Student Number		*Total Burnout (Intensity)
*Sex	*Verbal SAT	*Site Satisfaction		
	*Math SAT	*Self-Reported Stress Level	*Total TSI (Strength)	
	*G.P.A.			
	*NTE			
	*Course Satisfaction	*Role Conflict		
	*Self-reported Course Stress	*Role Ambiguity		
		*Negative/Positive Views Towards Teaching		

Table 2.

Role Conflict and Ambiguity Means by Observation Level

Training/ Teaching Level	Role Problems	
	Role Conflict	Role Ambiguity
Pre-Intern	2.3[a]	3.2
Intern	2.5	3.0
Student Teacher	2.3	2.6
Teaching Year 1	2.8	3.7
Teaching Year 2	2.9	4.2
Teaching Year 3	2.3	4.5
Teaching Year 4	2.6	4.6

[a] Means are based on the following rating scale: 1 = Not at all true of my job/placement; 7 = very true of my job/placement.

Table 3.

Stress Source Means by Observation Level

Training/ Teaching Level	Teacher Stress Inventory Subscales			
	Personal/ Professional Stressors	Professional Distress	Discipline and Motivation	Time Management
Pre-Intern	2.6[a]	2.4	2.4	3.1
Intern	2.7	2.5	2.7	3.1
Student Teacher	2.5	2.2	2.6	2.9
Teaching Year 1	2.8	2.3	2.7	2.7
Teaching Year 2	3.0	2.5	2.9	2.7
Teaching Year 3	2.8	2.3	2.5	2.5
Teaching Year 4	3.1	2.6	2.6	2.9

a) Means are based on the following rating scale: 1 = No strength, not noticeable; 5 = major strength, extremely noticeable.

Table 4.

Stress Manifestations and Total Stress Score by Observation Level

	Teacher Stress Inventory Subscale/Scale			
Training/ Teaching Level	Emotional Manifestations	Biobehavioral Manifestations	Physiological-Fatigue Manifestations	Total Stress Strength
Pre-Intern	2.9	1.7	2.3	2.5
Intern	2.8	1.9	2.4	2.6
Student Teacher	2.6	1.8	2.2	2.4
Teaching Year 1	2.5	1.5	2.0	2.3
Teaching Year 2	2.5	1.6	2.1	2.2
Teaching Year 3	2.2	1.4	1.8	2.2
Teaching Year 4	2.4	1.4	2.0	2.4

a) Means are based on the following rating scale: 1 = Little strength, not noticeable; 5 = major strength, extremely noticeable.

Table 5.

Burnout Mean Scores by Observation Level

Training/ Teaching Level	Burnout Variables			
	Emotional Exhaustion	Depersonalization	Lack of Personal Accomplishment	Total Burnout
Pre-Intern	2.3	1.5	3.1	2.3
Intern	2.3	1.8	3.3	2.6
Student Teacher	2.1	1.6	3.1	2.3
Teaching Year 1	2.4	1.8	3.6	2.6
Teaching Year 2	2.5	1.9	4.0	2.8
Teaching Year 3	2.2	1.7	4.4	2.7
Teaching Year 4	2.5	1.8	4.5	2.9

a) Means are based on the following rating scale: 1 = very mild, somewhat noticeable; 7 = major, very noticeable.

Table 6.

Prior-years predictors of total burnout reported in terms of explained burnout variance

Training/ Teaching Level Explained	Blocked Sets of Predictor Variables						
	Personal Variables	High Sch Variables	College Variables	Site Variables	Role Variables	Stress Variables	Total Variance
Pre-Intern	2.7	0	0	0	5.3	0	8.0
Intern	0	0	2.8	0	7.1	8.0	17.9
Student Teaching	0	0	0	0	4.2	14.4	18.6
Teaching Year 1	0	0	0	0	3.4	13.0	16.5
Teaching Year 2	0	0	0	0	0	15.0	15.0
Teaching Year 3	0	0	4.5	0	7.6	15.0	27.1
Teaching Year 4	0	0	9.5	0	7.61	15.0	32.1

*Percentages have been rounded to nearest tenth. Total maximum explainable percentage of the burnout construct is 100%.

Table 6.

Within-years predictors of total burnout reported in terms of explained burnout variance

Training/ Teaching Level	Blocked Sets of Predictor Variables						
	Personal Variables	High Sch Variables	College Variables	Site Variables	Role Variables	Stress Variables	Total Explained Variance
Pre-Intern	4.3*	0	0	14.5	7.9	15.6	42.2
Intern	3.9	0	0	0	11.9	14.6	30.3
Student Teaching	1	0	12.3	0	10.9	19.1	43.3
Teaching Year 1	0	0	0	0	36.1	20.1	57.0
Teaching Year 2	0	0	0	0	42.9	13.3	56.3
Teaching Year 3	0	0	0	6.9	26.4	14.8	48.0
Teaching Year 4	0	0	4.5	2.5	25.9	30.3	63.22

*Percentages have been rounded to nearest tenth. Total maximum explainable percentage of the burnout construct is 100%.

Unmet Needs, Role Problems, and Stress:

Predictors of Occupational Burnout Among New Teachers

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Running Head: NEEDS, ROLE PROBLEMS, STRESS AND TEACHER BURNOUT

Abstract

Earlier research has identified individual correlates of occupational stress and burnout. This study addressed the most promising variables -- needs deficiencies, role problems, and occupational stress levels -- and evaluated the extent to which each contributes to burnout levels. One-hundred-twenty-eight special education teachers provided demographic data and responded to four inventories: the Role Questionnaire, the Porter Needs Satisfaction Questionnaire, the Teacher Stress Inventory, and the Maslach Burnout Inventory. Pearson product-moment correlational analyses served to evaluate variable interrelationships. Then the variables were blocked and entered stepwise into four linear regression analyses, one predicting each burnout measure: Emotional Exhaustion, Depersonalization, Lack of Personal Accomplishment, and Total Burnout. Most of the needs, role, and stress variables related significantly, in one fashion or another, with each of the four burnout measures. The regression models demonstrated that various combinations of variables served to predict the differing manifestations of occupational burnout among the teachers. Eight predictors accounted for 69% of the variability of Emotional Exhaustion; seven variables explained 63% of Total Burnout; four contributed significantly to Depersonalization (41%); and (lack of) Personal Accomplishment was the least explained (three variables, 29%). The results were used to develop profiles that portray the interaction of the predictor variables with each of the burnout manifestations.

Unmet Needs, Role Problems, and Stress:
Predictors of Occupational Burnout Among New Teachers

Burnout in the teaching profession -- as in other occupations--has been the focus of many articles and much research over the last decade. The proliferation of studies has identified and evaluated many variables that can be used to predict burnout. Generally, personal (e.g., sex, age) and professional (e.g., number of years taught, size of caseload) background variables have proven to be poor predictors of burnout (Anderson, 1981; Schwab, 1980; Reetz, 1984). Other factors have emerged, however, that appear to better predict the frequency and intensity magnitude of burnout. Hughes (1983) found professional commitment, teaching gratification, and overall teaching stress to be significantly related to the burnout construct. D'Arienzo (1981) identified some background variables in combination with Obsessive-Compulsive Ideations and the individual's Teacher Belief System to be significant predictors. Additionally, all the subfactors from the Job Descriptive Index and the Job Stress Scale have proven significant contributors to burnout (Knowles, 1980). The extent to which these factors contribute to differences in burnout levels among teachers is limited, however. This present study focuses on some variables that have shown more promise in that undertaking.

Role conflict and role ambiguity have received a considerable amount of attention in the burnout literature since the turn of the decade. Reetz (1984) found role conflict to be significantly related to burnout factors Depersonalization and Emotional Exhaustion; additionally, role ambiguity was related to (lack of) Personal

Accomplishment on the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986). Westerhouse (1979) also demonstrated role conflict to be a significant predictor variable of burnout among teachers. In a study of high school department heads, Mansfield (1983) reported that role conflict and ambiguity were significantly related to feelings of powerlessness; all three of these variables explained significant percentages of variability of both the Emotional Exhaustion and Depersonalization subscales of the MBI. Schwab (1980) also used the MBI to evaluate the contributions of role conflict and role ambiguity to burnout among Massachusetts teachers. Together, the two variables accounted for 21% and 24% of the variability in the frequency and intensity dimensions, respectively, of the Emotional Exhaustion subscale, and for nine and 10% of these dimensions on the Depersonalization subscale; role ambiguity alone predicted the lack of Personal Accomplishment, explaining 6% and 3% of its frequency and intensity, respectively.

In another study of burnout among educators, role conflict and role ambiguity were considered in relationship to needs deficiencies (Katz, 1980). Needs deficiencies are expressed as the degree to which certain basic human, social, and personal needs go unmet on the job. The investigator found that principals who experienced greater role ambiguity also reported feelings of futility and low esteem for both themselves and others. Teachers, on the other hand, experienced greater role conflict and responded negatively to descriptions of trust, respect, and attraction towards colleagues and the organizations in which they worked. This interaction between role ambiguity, role conflict, and needs deficiencies argues for a closer examination of the role each plays in the overall burnout phenomenon.

Anderson (1981) measured the impact of need deficiencies upon teacher burnout by means of regression analyses; her findings closely paralleled those of Schwab's regression of role conflict and ambiguity upon burnout. In Anderson's study, various combinations of the needs subscales accounted for 21% and 24% of the variability of Emotional Exhaustion (frequency and intensity dimensions, respectively), 13% and 12% of Depersonalization, and 8% and 4% of (lack of) Personal Accomplishment.

In addition to role ambiguity, role conflict and needs deficiencies, occupational stress is a variable that has warranted examination as a predictor of burnout. Knowles (1980) reported findings on the Job Stress Scale that showed stress to be a predictor of specific burnout conditions or behaviors. In a parallel line of inquiry, Fimian (1983, 1984a, 1985) elaborated these predictors and examined more specifically those sources and manifestations of stress that are peculiar to school personnel, particularly teachers. His work resulted in a psychometrically defined construct of stress measurable by the Teacher Stress Inventory (TSI; Fimian, 1984a, 1985, 1988). This instrument operationalizes a number of factors related to teacher stress, and measures the perceived strength of stressful events in a fashion similar to the MBI. Research with human service workers (Fimian, 1984b) and with new teachers and teacher trainees (Fimian & Blanton, 1986a, 1986b), has shown that both role conflict and ambiguity are predictors of occupational stress as well as of burnout.

The purpose of the present study was to examine the extent to which and the fashion in which four variables -- role conflict, role ambiguity, needs efficiencies, and occupational stress -- prove to be predictors of burnout. To do this, data were collected from new special education teachers who had entered the profession between 1983 and 1988. It was hypothesized that: a) background variables such as teacher sex and age would predict little of the burnout variance; b) each of the five needs satisfaction variables -- security needs, social needs, esteem needs, autonomy needs, and self-actualization needs -- would, in one fashion or another, be significantly related to burnout, and would thus act as predictors of significant amounts of the burnout variance; c) each of the two role variables -- role conflict and role ambiguity -- would be significantly related to burnout, and would thus act as predictors of significant amounts of the burnout variance; d) and subsequent to the variance attributable to the background, needs, and role variables, occupational stress would predict additional burnout variance. Regression analysis served to determine the extent to which these variables could be used to predict burnout levels in teachers. Based on the idea that burnout is the end result of a number of work-related problems and stressors (Maslach & Jackson, 1986), seven stress variables were entered into the regression model at the last of four steps. Because background demographics rarely account for significant stress levels, these will be blocked and entered at the first step. Since no investigation has been conducted as yet to examine needs deficiencies concurrently with role conflict and ambiguity, these variables were entered at the second and third steps of the analysis, respectively.

METHOD

Sample

The sample used in this study consisted of 128 teachers, all new to teaching within the last four years and all alumni (not all females) from the same teacher-training institution. This study represented the fifth and final year of a five-year longitudinal study of stress among recent teacher graduates. The original sample consisted of 204 potential respondents; thus 64% of the teachers contributed usable surveys. Of the respondent group, 97% were female, they had a mean age of 23.4 (SD = 2.1), and they taught an average of 20.7 children (SD = 14.9).

Instrumentation

Four inventories were used in this study: The Role Questionnaire, The Porter Needs Satisfaction Questionnaire, the Teacher Stress Inventory, and the Maslach Burnout Inventory. Demographic data were collected using a cover sheet.

The Role Questionnaire. The Role Questionnaire (RQ; note Schwab, 1981) ascertains the degree of Role Conflict and Role Ambiguity (1 = Definitely Not True of My Job; 7 = Extremely True of My Job) that is received in one's job. The RQ consists of 14 items: negatively-stated items (1 through 8) assess Role Conflict; positively-stated items (9 through 14) focus on Role Ambiguity. The validity of these constructs was determined based on a number of factor analyses (Rizzo, House, & Lirtzman, 1970; Schuler, Aldag, & Brief, 1975). Split-half reliabilities approximated .90 for Role Ambiguity and .94 for Role Conflict (Keller, 1975). Alpha reliabilities of .85 for Role Conflict were established by Pierson (1983). The Role Questionnaire has been used with a number of both teachers (Schwab, 1980; Crane, 1981; Fimian & Blanton, 1986b) and human resource workers (Fimian, 1984b) to establish the positive link between teacher role problems and teacher stress.

The Porter Needs Satisfaction Questionnaire. The Porter Needs Satisfaction Questionnaire (PNSQ; note Anderson, 1981) consists of 13 items nested in five needs subscales: (a) Security Needs; (b) Social Needs; (c) Esteem Needs; (d) Autonomy Needs; and (e) Self-Actualization Needs. The instrument measures the difference (1 = Minimum; 5 = Maximum) between actual ("To what degree is this need currently being met?") and desired ("To what degree should this need be met?") need fulfillment. This difference is computed and labeled as a "perceived need deficiency" or "unmet need." The validity of the instrument has been examined by differentiating lower-order from higher-order need satisfaction (Weber & Hadd, 1974). Reliability data indicate test-retest reliabilities of .83 (Dore & Meachum, 1973) to .80 (Carlson, 1972).

The Teacher Stress Inventory. The Teacher Stress Inventory (TSI; Fimian, 1988) assesses stress in terms of the strength (1 = No Strength, Not Noticeable; 5 = Major Strength, Extremely Noticeable) of 49 stressful events nested in seven subscales: (a) Personal/Professional Stressors; (b) Professional Distress; (c) Discipline and Motivation; (d) Time Management; (e) Emotional Manifestations; (f) Biobehavioral Manifestations; and (f) Physiological-Fatigue Manifestations. The strength subscale scores are summed to develop the Total Stress Strength Score. From this stress strength score the respondent is not designated as being "under stress" or "not under stress;" instead, he or she is placed on a continuum of "more" to "less stressed." TSI construct validity was examined based on eight statewide samples of teachers and an additional 15 samples of convenience. At the beginning of the longitudinal study, of which this investigation is one part, factor analyses that employed oblique and varimax rotations resulted in seven stress factors. Later work, based on a larger n of 3,401 teachers (Fimian, 1988; Fimian & Fastenau, 1988), resulted in ten conceptually similar factors. Since this longitudinal study originated prior to the more recent minor reformulation of the TSI, the original seven-factor structure was maintained. Based on these seven factors, internal consistency reliability estimates of .90 to .98 were established (Fimian, 1982, 1984, 1985, 1986c; McHardy, 1982; Zacherman, 1982). Expert appraisal data for the content validity of the TSI are also available (Fimian, 1987, 1988). Test-retest reliabilities range from .78 to .98 and average .87 (Fimian, 1986a, 1988).

The Maslach Burnout Inventory. The Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986), an instrument previously used with regular teachers (Anderson, 1981; Schwab, 1980), special education teachers (Crane, 1981; McIntyre, 1981), and human service workers (Fimian, 1984b), assesses the intensity of burnout by means of 22 statements about respondents' attitudes, feelings, and perceptions of themselves and of their clientele. Respondents rate each statement on a scale from 1 (Very Mild, Barely Noticeable) to 7 (Major, Very Strong). Statements are grouped into three factors: (a) Emotional Exhaustion; (b) Depersonalization; and (c) Personal Accomplishment. The Personal Accomplishment subscale, typically phrased in a positive sense, indicates the presence of personal accomplishment. In this investigation, though, the teachers' responses on the Personal Accomplishment scale were reflected; i.e., the items were reverse-scored so as to indicate the lack of personal accomplishment. A rating of 1 (Very Mild, Barely Noticeable) would then be read as a 7 (Major, Very Strong); all remaining points on the scale were reflected as well. In so doing, all three burnout subscales indicated the presence of burnout-related problems. Individual subscales scores were then summed and divided by the number of subscales to yield a Total Burnout Score. The MBI was developed using factor analysis techniques with populations of human service professionals. The scores do not designate the subjects as "burned out" or "not burned out;" instead, they place respondents on a continuum from "less burned out" to "more burned out." The internal consistency reliability estimates of the MBI's subscales range from .77 to .81 (Maslach & Jackson, 1981, 1986) and .75 to .90 (Iwanicki & Schwab, 1981) for teachers.

Design and Procedures

The design used for this investigation was a "cross-sectional" survey design (Huck, Cormier & Bounds, 1974); the sample of special education teachers was surveyed once using paper and pencil procedures. One envelope containing an introductory letter, survey, and prestamped pre-addressed return envelope was distributed to 205 special education teachers throughout the Southeast. Data were coded during March and analyses conducted June of 1988.

Statistical Analyses

Two statistical analyses were conducted using the needs, role, stress and burnout data provided by the special education teachers -- Pearson product-moment correlational analysis and multiple linear regression analysis. To conduct these analyses, we used the updated version (SPSS-X, Version 10; Norusis, 1986) of the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975).

Variable interrelationships. The relationships among the needs, role, stress and burnout variables were investigated using Pearson product-moment correlational analyses. Since the first three variables would ultimately be tested as predictors of burnout, each of the these variables -- needs, role, and stress -- were correlated with the three MBI subscales and the MBI Total Score. It was hypothesized that each of these variables would correlate with the burnout constructs in the low-moderate to moderate range.

Burnout predictors. Since the predictive nature of the needs, role, and stress variables for burnout was of particular interest, these variables were blocked by set and entered into four regression analyses, one each for Emotional Exhaustion, Depersonalization, Lack of Personal Accomplishment, and Total Burnout. Based on the simple correlational relationships and models of burnout-inducing stress posited elsewhere (Maslach & Jackson, 1986; Fimian, 1988), much of the recent stress and burnout prediction research has employed this type of variable inclusion both within and across regression analysis steps. Since relatively little of the burnout variation is predicted by background variables such as age and sex, such variables are typically entered at the first step. Variables related to the person -- but not directly to the job -- are usually entered next. In this investigation, we chose to block the five needs variables -- Security, Social, Esteem, Autonomy, and Self-actualization -- and enter them in a stepwise fashion. Doing so allowed for the predictor that accounted for the most variance in the criterion (e.g., one of the burnout constructs) to enter first, and subsequent predictors to enter the model only if they accounted for additional significant variance. The significance of the F ratio used to determine the degree of change in variance from step to step was computed using the incremental validity formula; thus the F ratio reported at each step is for the significance of one or more blocked predictors at the point of entry into the model. Similarly, Role Conflict and Ambiguity were entered at the third step in stepwise fashion. Stepwise inclusion was again employed at the fourth step of the model, at which point the seven stress variables were entered. Finally, at that same step, the shrunken R^2 was computed; this measure is an estimate of the population squared multiple correlation coefficient based on the sample that was surveyed (Kerlinger & Pedhazur, 1973).

RESULTS

A number of results were evident, both in terms of variable interrelationships and the regression prediction of burnout.

Variable Interrelationships

When each of the needs, role, and stress variables were correlated with the three MBI subscales and the Total Burnout Score, it was apparent that the majority of the relationships were significant at or beyond the .001 probability level; as noted in Table 1, over 90% of the possible coefficients' magnitudes were sufficiently large so as to exceed this level. In the case of one MBI subscale -- Lack of Personal Accomplishment -- there were three correlations noted at the .05 level and one at trend level. Additionally, Social Needs correlated with Depersonalization at the .05 level. Security Needs, Self-Actualization Needs, and Biobehavioral Manifestations were marginally, yet significantly, related to Lack of Personal Accomplishment. Social Needs was related to lack of Personal Accomplishment at trend levels.

Overall, the needs, role, and stress variables were related the strongest to Emotional Exhaustion, with a range of .29 (Social Needs and Emotional Exhaustion) to .71 (Professional Distress and Emotional Exhaustion); these relationships were significant at or beyond the .001 probability level. Depersonalization was the next strongest-related variable with respect to needs, role problems, and stress with a coefficient range of .25 (Social Needs and Depersonalization; $\underline{p} \leq .05$) to .61 (Discipline/Motivation and Depersonalization; $\underline{p} \leq .001$) of the three burnout variables, Lack of Personal Accomplishment was the least related to needs, role problems, and stress with a range of .15 (Social Needs and Lack of Personal Accomplishment; $\underline{p} \leq .07$) to .43 (Role Ambiguity and Lack of Personal Accomplishment; and Discipline/Motivation and Lack of Personal Accomplishment; both $\underline{r}$s exceeded the .001 probability level). The Total Burnout Score also was significantly related to the needs, role, and stress constructs, with a low of .27 (Social Needs and Total Burnout; $\underline{p} \leq .001$) to a high of .71 (Discipline and Motivation with Social Needs; $\underline{p} \leq .001$).

Since the vast majority of the variables were significantly related to Emotional Exhaustion, Depersonalization, Lack of Personal Accomplishment and Total Burnout, each was included in the regression analyses that would predict one or the other of these burnout variables.

Insert Table 1 about here

Burnout Prediction

As noted in Table 2, the background variables sex, age, and student number were entered at the first step of the regression model; next, each of the five security subscales of the PNSQ were entered at the second step; Role Conflict and Ambiguity were then entered at the third step; and, at the fourth step, each of the seven TSI variables were entered. All variables were entered in stepwise fashion within steps, first for Emotional Exhaustion, next for Depersonalization, then for Lack of Personal Accomplishment, and finally for Total Burnout. Thus, four separate and discrete regression analyses were conducted, each using identical predictor variables.

Insert Table 2 about here

Emotional Exhaustion predictors. As noted in Table 2, the background variables bore little relationship with the Emotional Exhaustion variance. Of the five potential needs satisfaction predictors, only two proved to predict significant amounts of Emotional Exhaustion; Self-Actualization Needs and Esteem Needs predicted 22% and 5% of the burnout construct, respectively. Next, at the third step, both Role Conflict and Role Ambiguity explained an additional 15% and 3%, respectively. Finally, at the fourth step, the stress variables Time Management, Professional Distress, Emotional Manifestations, and Personal-Professional Stressors accounted for an additional 18%, 5%, 2%, and 2% of the Emotional Exhaustion variance, respectively. After controlling for shrinkage, a combination of eight needs, role, and stress variables accounted for 69.4% of the variance associated with Emotional Exhaustion.

Depersonalization predictors. The background variables had little bearing on the Depersonalization construct. At the second step, though, two different needs from those that predicted Emotional Exhaustion entered the model -- Autonomy Needs and Security Needs -- each explaining 22% and 5% of the Depersonalization variance, respectively. At the third step, only Role Ambiguity entered the model, explaining an additional 16% of the Depersonalization construct. Finally, at the fourth and last step, only one of seven potential stress predictors entered the model -- Discipline and Motivation -- at 13%. Overall, after controlling for shrinkage, a combination of four needs, role, and stress variables accounted for 40.7% of the variance associated with Depersonalization.

Lack of Personal Accomplishment predictors. As with the other MBI scales, the background variables accounted for little if any of the Lack of Personal Accomplishment construct. At the second step, only one of the five potential needs variables entered the model, Esteem Needs explaining 16% of the variance. At the third step, only Role Ambiguity entered, accounting for an additional 10%. And at the fourth and final step, Emotional Manifestations predicted an additional 5% of Lack of Personal Accomplishment. After controlling for shrinkage, three needs, role, and stress variables accounted for 28.5% of the variance associated with a Lack of Personal Accomplishment on the job.

Total Burnout predictors. The fourth regression analysis was used to predict the MBI Total Burnout Score. As in the case of the three MBI subscales, background variables predicted little if any of the Total Burnout variance. At the second step, only two of five potential predictors entered the equation; Autonomy Needs and Self-Actualization Needs accounted for 25% and 4% of the burnout construct, respectively. Then, at the third step, both Role

Ambiguity and Role Conflict entered, explaining an additional 11% and 4%, respectively. Finally, at the fourth step, three of the seven potential stress variables entered the model; Discipline and Motivation, Emotional Manifestations, and Professional Distress explained 14%, 4%, and 2% of the burnout variance, respectively. After controlling for shrinkage, 63.3% of the Total Burnout construct was explained by a combination of seven needs, role, and stress variables.

From these data, it is apparent that Emotional Exhaustion was the best explained construct (with eight predictors accounting for 69.4%); Total Burnout was the next best explained (with seven variables explaining 63.3%); Depersonalization was the next best explained (four predictors explaining 40.7%); and, finally, Lack of Personal Accomplishment was the least explained (with three predictors explaining 28.5%). Nonetheless, significant percentages of each burnout variable's overall variance was explained by the other variables under investigation.

DISCUSSION

There were significant interrelationships between and among practically all the variables in this investigation, and at least a few of them could be used to predict the various manifestations of occupational burnout among the special education teachers. Emotional Exhaustion seemed the most predictable in terms of the needs, role, and stress predictors; Depersonalization was the next most predictable; and Lack of Personal Accomplishment proved to be the hardest to predict. Consistent with earlier research, the role of background variables as predictors of burnout was negligible. However, at least some of the variables included in each of the other blocked sets of predictors entered the formula; that is, regardless of the burnout construct being considered, teachers' needs, role problems, and stress levels in one form or another played a major role in predicting burnout levels.

The present study supported the findings of earlier investigations which have demonstrated both stress factors (Knowles, 1980) and various combinations of Need Deficiencies (Anderson, 1981) to be good predictors of burnout. In addition, the results presented here with respect to Role Conflict and Ambiguity are also generally consistent with earlier findings. Reetz (1984), Mansfield (1983), and Schwab (1980) all found that both Role Conflict and Role Ambiguity were significant predictors of both Emotional Exhaustion and of Depersonalization. In our study, both role factors were indeed predictive of Emotional Exhaustion, but only Role Ambiguity contributed to the explained variance in Depersonalization. Like Maslach and Jackson (1986), Role Ambiguity alone served as a predictor of Lack of Personal Accomplishment. Finally, with respect to Total Burnout, the immediate results differed from Westerhouse (1979) in that not only Role Conflict, but also Role Ambiguity proved to be significant predictors of burnout.

Maslach and Jackson (1986) stressed the importance of viewing separately each of the MBI factors when considering the burnout levels of respondents to their inventory. This investigation supports the distinction between the individual burnout factors insofar as the data indicate that certain job-related problems appear to differentially lend themselves to higher levels of one particular burnout problem over the others. That is, different patterns of needs, role, and stress variables combined to predict the optimum amount of variance associated with each of the burnout variables -- Emotional Exhaustion, Depersonalization, Lack of Personal Accomplishment, and Total Burnout. Not only do the sets of predictor variables differ for each of the burnout variables, but they predict each burnout factor to varying degrees. Emotional Exhaustion was the best predicted burnout construct with two need variables, two role variables, and four stress variables predicting almost 70% of its variance. Conversely, Lack of Personal Accomplishment was the least-predicted burnout variable, with only one need, one role, and one stress variable predicting less than three-tenths of its variance. Teacher gender, age, and the number of students taught contributed little if any to the prediction of the burnout variables.

Based on the information collected from these teachers, it is possible to establish a "profile" for each of the groups experiencing one or more particular forms of burnout. For example, those most prone to Emotional Exhaustion are those who also experience lower levels of both Self- Actualization and Esteem Needs, particularly the former of the two. Teachers no longer experiencing the intrinsic joys of teaching and who feel that teaching actually undermines their perceptions of self-worth are those most apt to become emotionally exhausted. In addition to having these unmet needs, they report more Role Conflict and Ambiguity. They find themselves "between a rock and a hard place" with respect to on-the-job conflict; occasionally, too, they are not quite sure what they are supposed to do or when they are supposed to do it. Furthermore, there are a number of stress-related problems that may precede and contribute to overall burnout levels, including Time Management, Professional Distress, Emotional Manifestations, and a number of Personal-Professional stressors experienced on the job. So, not only are these teachers reporting a number of higher-order unmet needs and role problems, they also find that they cannot manage their time efficiently, have problems with their professional self-concept, are not dealing very well with the job on an emotional level, and perceive a number of job-related events as causing them more than usual stress. Considering this combination, it is not surprising that these teachers report more intense levels of Emotional Exhaustion.

Those experiencing and reporting elevated Depersonalization levels actually have fewer problems related to needs, roles and occupational stress than do the "emotionally exhausted" -- at least in terms of the limited number of personal and organizational variables that we examined. These teachers also experience greater unmet needs related to both autonomy and security.

Similarly, those experiencing elevated levels of Lack of Personal Accomplishment also reported fewer of these work-related problems; these teachers claimed a number of unmet Esteem Needs, experienced more Role Ambiguity than Role Conflict, and have a number of stress-related Emotional Manifestations with which to cope.

When considering those teachers who are most prone to Total Burnout, as few as seven problems predicted their burnout levels -- but did so very well. These teachers reported a number of problems with unmet Autonomy and Self-Actualization Needs. Those least able to function on an independent level and who experience little intrinsic worth in their jobs are those most apt to report higher burnout levels. Role Ambiguity and Role Conflict present an additional set of problems with which they have to deal -- particularly the former. Apparently, not "knowing the ropes" within the first four years of teaching could result in elevated burnout levels. Finally, these teachers are very apt to experience and report higher levels of Discipline and Motivation problems, Emotional Manifestations of stress, and Professional Distress in terms of impoverished "professional self-concepts."

These results are very consistent with both the empirical research and the observational reports that have been published about teachers experiencing elevated burnout levels. Typically, though, earlier investigations examined teacher burnout in light of one of its correlate problems -- either deficient needs, or role problems, or on-the-job stress levels. This investigation attempted to "tie together" all these variables in such a fashion that profiles of burned-out or at-risk teachers would result. For the better part of a decade Maslach and Jackson (1986) have advocated for the that the burnout variables Emotional Exhaustion, Depersonalization, and Lack of Personal Accomplishment are discrete and separate problems and that only if they combine in one particular fashion can the MBI respondent be considered as being "burned out." Concurrently, a number of investigators have examined particular problems that may or may not contribute to each of these burnout problems. Schwab (1980) and Crane (1981), for example, were two of the first investigators to establish that role-related problems may be related to burnout. Similarly, Anderson (1981) was the first to perceive, and establish, the potential relationships between and among unmet needs on the job and higher levels of burnout. Concurrently, Fimian (1980; 1982; 1983ab; 1984ab; 1985;1987; 1988) established the link between occupational stress and burnout among personnel experiencing elevated stress and burnout levels. In one study among human service workers, for example, he was able to establish the link between role problems, stress levels, and occupational burnout (1984b). Throughout the course of this work and, in light of some of the limitations posed to survey researchers (e.g., make your survey short or people won't answer it...), Maslach and Jackson (1986) have said that the "explanations" for burnout -- whether they be data-based or not -- are probably complex combinations of job-related variables, and not the simple relationships between one variable and another as many have investigated to date. In fact, the causes of occupational burnout are probably very numerous, diverse for different teachers and different teacher groups and, as we have established in this investigation, different for those teachers experiencing one particular burnout problem as opposed to another.

Only when we can identify the particular problems that lend themselves most to each specific burnout problem -- Emotional Exhaustion, Depersonalization, Lack of Personal Accomplishment, and Total Burnout -- will we understand the the nature of how each type of burnout experience fits into, and is supported by, our schools.

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Table 1

Needs, role problems, stress, and burnout variable interrelationships

Needs Role and Stress Variables	Burnout Variables Emotional Exhaustion	Deperson- alization	Lack of Personal Accomplishment	Tota Burno
Needs Deficiencies				
Security Needs	.31	.38	21*	37
Social Needs	.29	.25*	15t	27
Esteem Needs	.45	.30	40	48
Autonomy Needs	.41	.44	37	50
Self-Actualization Needs	.47	.27	22*	41
Role Problems				
Role Conflict	.58	.43	.25	.54
Role Ambiguity	.48	.41	.43	.55
Occupational Stress				
Personal-Professional Stressors	.63	.30	.24	.51
Professional Distress	.71	.53	.31	.67
Discipline and Motivation	.64	.61	.43	.71
Time Management	.70	.42	.30	.62
Emotional Manifestations	.61	.41	.37	.59
Biobehavioral Manifestations	.30	.26	.17*	.31
Physiological-Fatigue Manifestations	.57	.40	.28	.54

t $p \leq .05$ to .10
* $p \leq .05$
** $p \leq .01$

NOTE. All remaining correlations are significant to the .001 level or beyond.

Table 2

Subscale-level predictors of burnout factors

Step No.	Predictor Variables	Multiple R	R^2	Change in R^2	Adj. R^2	F Ratio
	Emotional Exhaustion					
1	Student Number, Sex, Age	.0000	.0000			
2	Self-Actualization Needs	.4653	.2165	.22		34.82***
	Esteem Needs	.5188	.2692	.05		23.02***
3	Role Conflict	.6490	.4212	.15		30.08***
	Role Ambiguity	.6708	.4500	.03		25.26***
4	Time Management	.7929	.6288	.18		41.32***
	Professional Distress	.8238	.6786	.05		42.59***
	Emotional Manifestations	.8344	.6963	.02		39.30***
	Personal-Professional Stressors	.8447	.7136	.02	.6943	37.06***
	Depersonalization					
1	Student Number, Sex, Age	.0000	.0000			
2	Autonomy Needs	.4340	.1883	.19		29.24***
	Security Needs	.4724	.2232	.04		17.96***
3	Role Ambiguity	.5305	.2814	.16		16.19***
4	Discipline and Motivation	.6523	.4254	.13	.4068	22.77***
	Lack of Personal Accomplishment					
1	Student Number, Sex, Age	.0000	.0000			
2	Esteem Needs	.3983	.1587	.16		23.77***
3	Role Ambiguity	.5067	.2567	.10		21.59***
4	Emotional Manifestations	.5490	.3014	.05	.2846	17.84***

(Table 2 continued)

	Total Burnout					
1	Student Number, Sex, Age	.0000	.0000			
2	Autonomy Needs	.4982	.2482	.25		41.60***
	Self-Actualization Needs	.5355	.2867	.04		25.12***
3	Role Ambiguity	.6330	.4007	.11		27.63***
	Role Conflict	.6656	.4430	.04		24.46***
4	Discipline and Motivation	.7664	.5873	.14		34.73***
	Emotional Manifestations	.7939	.6303	.04		34.38***
	Professional Distress	.8082	.6531	.02	.6329	32.28***

*$p \leq .05$
**$p \leq .01$
***$p \leq .001$

Appendix C

Mockup of the information return that
was sent to each respondent in the project

INTRODUCTION TO THE TEACHER STRESS INVENTORY MEASURES

Data-based models of teacher stress and burnout have the advantages of being tested across numbers of teacher groups and teaching situations and of being compared with or related to already-established classroom factors. One such model, developed by Fimian and called the Teacher Stress Inventory, defines teacher stress in terms of a number of classroom and professional factors.

Teacher Stress Inventory

The Teacher Stress Inventory (TSI) assesses stress in terms of both the strength (1 = No Strength, Not Noticeable; 5 = Major Strength, Extremely Noticeable) of 49 stressful events nested in seven subscales: (a) Work-Related Stressors; (b) Professional Distress; (c) Discipline and Motivation; (d) Time Management; (e) Emotional Manifestations; (f) Biobehavioral Manifestations; and (g) Physiological-Fatigue Manifestations. Subscale scores are summed and divided by the number of subscales to derive the Total Stress Strength Score. These scores place the respondent on a continuum of "more" to "less stressed."

Sources of stress. Notice stress factor "S1" on the attached three-dimensional chart; this stands for the strength of Work-Related Stressors. This subscale suggests that teachers scoring highly on this factor feel that they lack preparation time, that their personal priorities are being shortchanged, that there is too much work to do and that their caseload is too big, that there is too much paperwork associated with their roles and that the pace of the school day is too fast. The second stress factor, "S2," stands for the strength of Professional Distress. Teachers scoring highly on this dimension strongly feel that they lack promotion opportunities, on-the-job progress, professional status, respect and recognition, control over the school related matters, on-the-job emotional stimulation, and professional improvement opportunities. Additionally, they often and strongly feel that their attitudes and opinions are of little concern in the work place.

Another source of stress is reflected in the factor entitled "S3," or the strength of Discipline and Motivation problems. The items in this category reflect the extent to which the respondent perceives having to continually monitor pupil behavior, discipline problems in the classroom, having to teach poorly motivated students or students who would do better if they applied themselves more to their studies, a lack of adequate discipline policies, and having one's authority rejected by either students or staff as being strong sources of stress. The fourth stress factor, "S4," represents the strength of Time Management. High scorers on this factor feel that there is little time to accomplish on-the-job responsibilities, that there is little time to relax during the school day, that they have too much work with too little time in which to do it, and that they have to do more than one thing at a time.

Stress manifestations. The aforementioned stress sources result in a number of stress manifestations. The first manifestation factor, "S5," stands for the strength of Emotional Manifestations.

Respondents scoring highly on this factor feel frequently and strongly anxious, insecure, depressed, unable to cope, and vulnerable. Stress factor "S6" represents Biobehavioral Manifestations. Respondents scoring highly on this dimension not only experience strong cardiovascular problems (e.g., rapid breath and feelings of increased blood pressure), but also respond to stress in one or more inappropriate ways (e.g., calling in sick, or using over-the-counter, prescription, or alcoholic drugs) in order to ameliorate their overall stress levels. Finally, the last stress factor, "S7," stands for Physiological-Fatigue Manifestations. High scorers on this dimension strongly feel physically weak and exhausted, become fatigued rapidly, and strongly feel the effects of stomach acid, stomach cramps, and stomach pain of extended duration.

Total stress. The scores of each of these TSI subscales are then summed and divided by seven (the number of subscales) to yield the Total Stress Score. This index represents your overall stress level, and is represented as stress factor TOTAL on your chart. Immediately below your total score is a percentile designation; this indicates how much stress you are experiencing compared to some 3,400 other teachers who have completed the TSI. A value of 4 indicates that you scored somewhere between the 40th and 50th percentile; a value of 9 indicates that you scored between the 90th and 100th percentile. The higher the value, the greater the amount of stress you are experiencing. These values are based on your stress levels reported for this year.

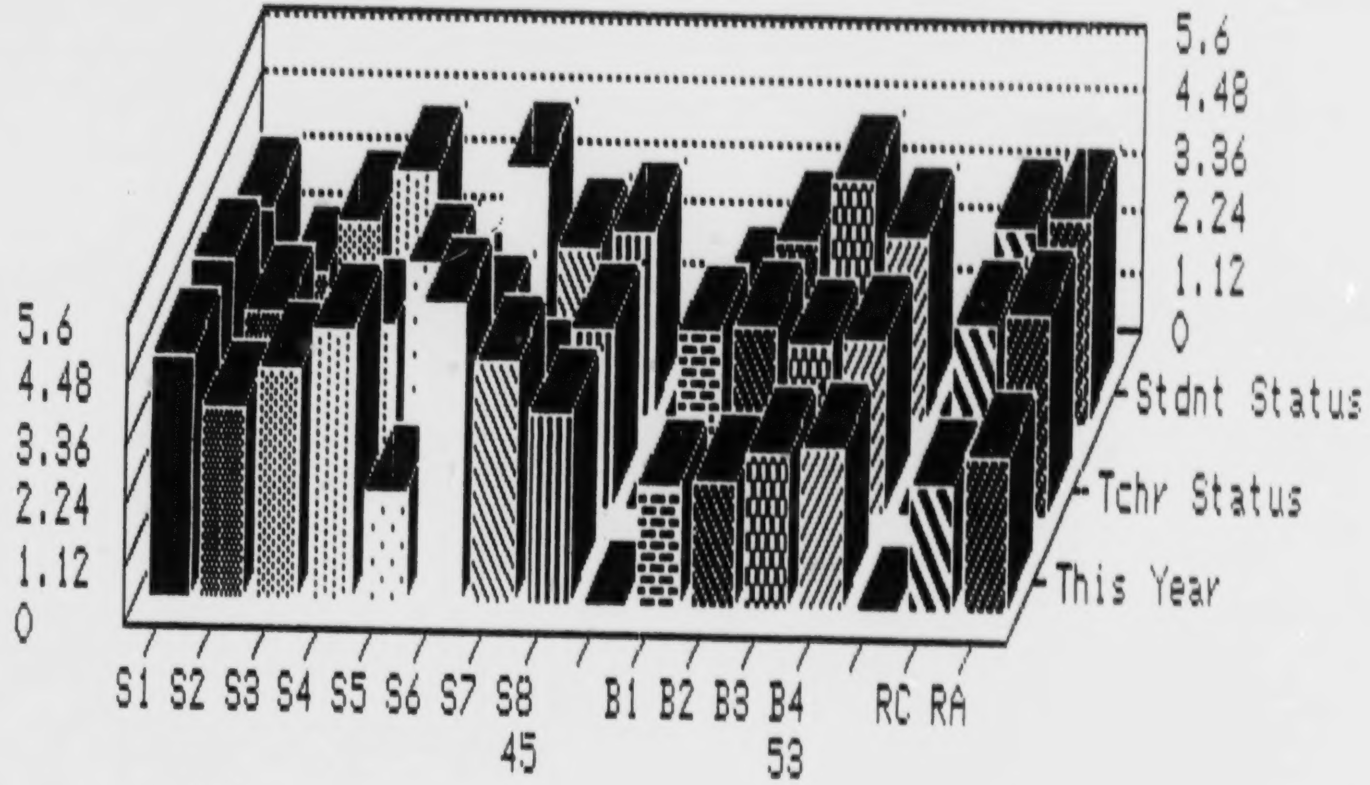
Interpreting Your Scores. There are two scoring conventions included in this packet. The first is a three-dimensional graph. On this chart we have included your average scores for each of the stress variables for your student years ("Stdnt Status"), your prior teaching years (if any; "Tchr Status"), and for your present teaching year ("This Year"). If this is your first teaching year, your "Tchr Status" and "This Year" scores will be the same. You should be able to get a "feel" for what you've been experiencing stress-wise over the last few years by comparing the relative levels of each variable across time (i.e., student to teacher to this year). The S1... S8 designations correspond to the variables outlined on the last page and a half. The RC, RA, B1, B2, B3, and MBI designations will be discussed shortly.

The second scoring convention, designated the "Teacher Stress Profile" can be used to give you a more detailed perspective of where you stand stresswise. Your S1... to TSI scores are provided on the brief spreadsheet stapled to the profile. In the same order in which they are listed on the spreadsheet, enter your "This Year's" (or other) scores from left to right on the profile. If your score for any variable is positioned above the "Sig Hi" line, then your stress levels for that particular variable has exceeded significantly high levels of stress; conversely, if your score falls below the "Sig Lo" line, you are experiencing significantly weaker than average stress. If your score falls on or near the middle "Average" line, you are experiencing average levels of stress with respect to that particular stress factor.

Role Conflict and Ambiguity. On the three-dimensional graph, the middle set of variables -- designated RC and RA -- stand for role conflict and role ambiguity. Role conflict occurs to person when he or she has sufficient information about performing their job, but this information puts the individual in conflicting situations -- somewhat like being between a rock and a hard place. Items that deal with role conflict include having to do things that should be done differently, having to work on unnecessary things, receiving assignments without the proper manpower to complete them, working with two or more groups that work quite differently, having to buck a rule or policy in order to carry out an assignment, receiving incompatible requests from two or more people, and having to do things that are apt to be accepted by one person and not accepted by others. Role ambiguity, on the other hand, deals more with "learning the ropes" types of issues. Teachers experiencing strong levels of role ambiguity are usually not quite sure what is expected of them, feel uncertain about how much authority they have, have few clear well-planned goals related to their job, are not quite sure how to divide their time properly, are uncertain about what their responsibilities are, and do not receive clear explanations of what is to be done or how it is to be done. Low role conflict and ambiguity scores (i.e., 1s or 2s) indicate that you have few problems; a mid-range score of 3 indicates moderate problems; a high score of 4 to 5 indicates strong problems related to these concerns. We have consistently found that those teachers experiencing high levels of role conflict and ambiguity are also those who report higher-than-would-be-expected levels of stress.

Teacher Burnout. The last set of variables on the three-dimensional graph -- B1, B2, B3, and MBI -- each represent a teacher burnout factor. Emotional Exhaustion, identified as B1, occurs to teachers when they feel wiped out, at the end of their rope, feel used up at the end of the day, and generally burned out from the job. The second burnout factor, designated B2 or Depersonalization, occurs when teachers start to think of their students as "caseloads" or "file folders" by holding them at arm's length. During stressful times, one of our subconscious means of coping with problems is to remove ourselves emotionally from them. Thus, those who experience high levels of Emotional Exhaustion are often those who depersonalize their students. The third burnout variable, designated B3 or Lack of Personal Accomplishment, describes those work-related events that occur when a person no longer feels that they are accomplishing anything on the job. It is possible to feel emotionally exhausted and to depersonalize children and youth and still feel like you are accomplishing something as a teacher. Under these conditions, you would not be considered to be burnt out. If you feel emotionally exhausted however, and you depersonalize your students, and you feel like you are not accomplishing anything, there is a better than even chance that you are burned out. Burnout scores for the three burnout factors and for total burnout that fall in the 3, 4, or 5 range indicates a problems with burnout.

Attached to this summary is a brief bibliography of information that will let you find out more about these matters, should you so desire. G'Day.



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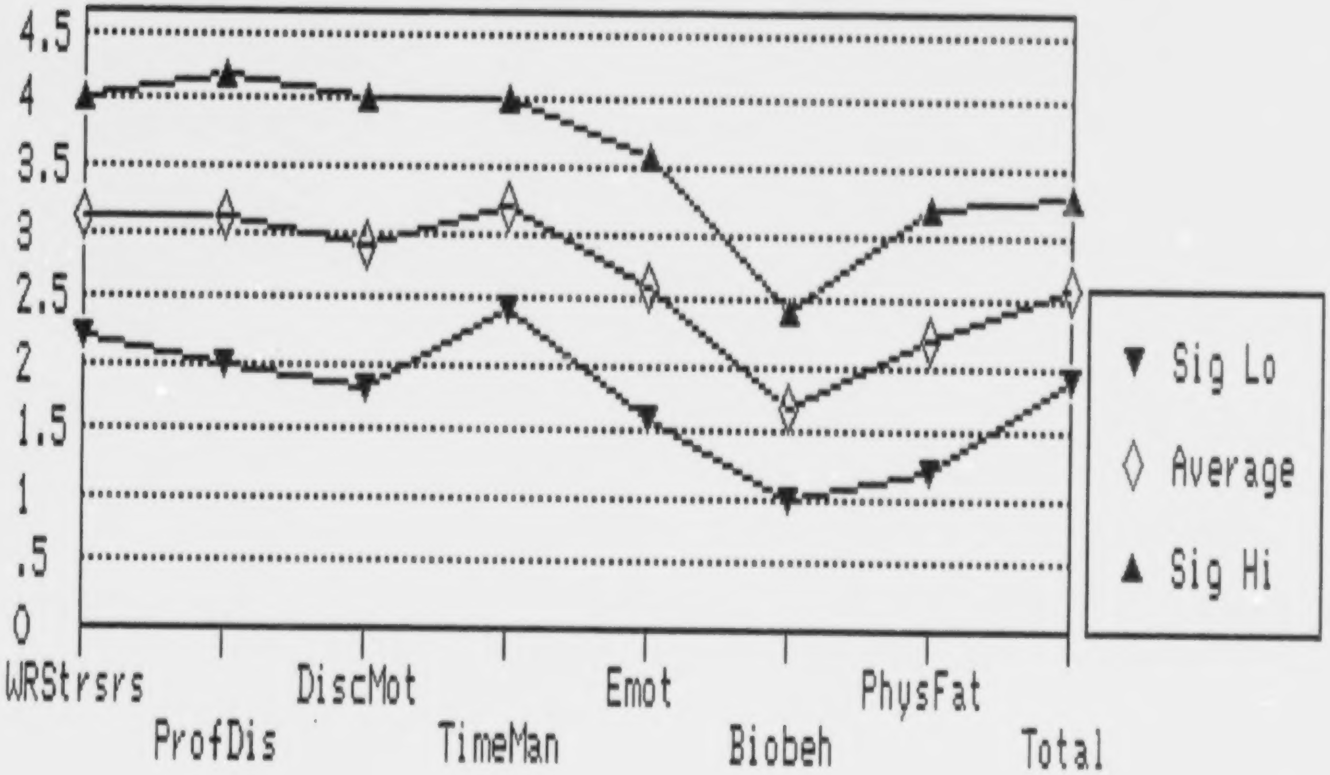
TEACHER STRESS PROFILE



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TEACHER STRESS AND BURNOUT REFERENCES

(Other, more technical, references are also available)

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Appendix D

Sample of the machine scorable forms

Read each statement and decide if you ever feel this way about your placement. If so, indicate how strongly by filling in the related bubble.

5. MAJOR STRENGTH; EXTREMELY NOTICEABLE
4. GREAT STRENGTH; VERY NOTICEABLE
3. MEDIUM STRENGTH; MODERATELY NOTICEABLE
2. MILD STRENGTH; BARELY NOTICEABLE
1. NO STRENGTH; NOT NOTICEABLE; NOT APPLICABLE

1. The pace of the school day is too fast.
2. I am not emotionally/intellectually stimulated teaching.
3. I lack promotion and advancement opportunities.
4. I do not receive an adequate salary and/or recompense.
5. I feel frustrated because I have to monitor pupil behavior.
6. I feel frustrated because of discipline problems in my classroom.
7. I rush in my speech.
8. I become impatient if others do things too slowly.
9. I think about other things during conversations.
10. The pace of my coursework is too fast.
11. I am not adequately emotionally and intellectually stimulated in my coursework. -->
12. I have too much coursework to do.
13. I am not progressing on my internship/student teaching (I/ST) as rapidly as I would like. ------------------------------------->
14. I do not have control over decisions made about my coursework.
15. My class/caseload is too big.
16. I have too much work to do.
17. I do not receive enough status and respect on my job.
18. I lack control over decisions made about matters in my classroom or school. -->
19. I feel frustrated because of inadequate discipline policies in my school and/or district. ------------------------------------->
20. I feel frustrated because my authority is often rejected by pupils and/or administration. -------------------------------------->
21. There is not enough time to get things done.
22. I have little time to relax and enjoy the time of day.
23. I detest wasting time.
24. There is too much paperwork required in my I/ST.
25. I am not adequately emotionally and intellectually stimulated by my coursework. --->
26. I lack recognition for the work that I do in my I/ST.
27. I am not progressing in my coursework as rapidly as I would like.
28. My personal attitudes, opinions, and values are not given sufficient airing in my internship/student teaching.---------->
29. There is too much administrative paperwork in my job.
30. I lack recognition for the extra work and good teaching that I do.
31. I am not progressing in my job as rapidly as I would like.

PLEASE TURN TO REVERSE SIDE

BEST COPY AVAILABLE

5. MAJOR STRENGTH; EXTREMELY NOTICEABLE
4. GREAT STRENGTH; VERY NOTICEABLE
3. MEDIUM STRENGTH; MODERATELY NOTICEABLE
2. MILD STRENGTH; BARELY NOTICEABLE
1. NO STRENGTH; NOT NOTICEABLE; NOT APPLICABLE

32. My personal attitudes, opinions, and values are not given airing in my classroom or school. --------------------------->
33. I feel frustrated attempting to teach poorly motivated students.
34. I feel frustrated because certain students of mine would do better if they only tried harder. --------------------------------->
35. I have to try doing more than one thing at a time.
36. I easily overcommit myself.
37. The pace of the school day during my I/ST is too fast.
38. There is too much paperwork required in my coursework.
39. I have too much work to do for my internship/student teaching.
40. I lack recognition for the work I do in my courses.
41. I lack control over decisions made about matters in my I/ST.
42. My personal attitudes, opinions, and values are not given sufficient airing in my courses. ---------------------------->

I respond to stress by/with...

43. feeling anxious.
44. feeling unable to cope.
45. making use of over-the-counter drugs.
46. stomach cramps.
47. feelings of increased blood pressure.
48. procrastinating.
49. becoming fatigued in a very short time.
50. feeling insecure.
51. feeling vulnerable.
52. making use of prescription drugs.
53. stomach pain of extended duration.
54. rapid breathing.
55. physical weakness.
56. feeling depressed.
57. calling in sick.
58. stomach acid.
59. feeling my heart pounding or racing.
60. sleeping more than usual.
61. feeling physically exhausted.

Your Social Security Number ____ - _____ - ______

PLEASE CONTINUE TO NEXT PAGE

Read each statement and decide if you ever feel this way about your placement/job. Indicate how much by filling in the related bubble.

5. EXTREMELY TRUE OF MY PLACEMENT/JOB
4.
3.
2.
1. DEFINITELY NOT TRUE OF MY PLACEMENT/JOB

1. I have to do things that should be done differently.
2. I have to work on unnecessary things.
3. I receive assignments without the proper manpower to complete them. ------------------------------------->
4. I receive assignments without adequate resources and materials to execute them. ------------------------->
5. I work with two or more groups who operate quite differently.
6. I have to buck a rule or policy in order to carry out an assignment. ------------------------------------->
7. I receive incompatible requests from two or more people.
8. I do things that are apt to be accepted by one person and not accepted by others. ------------------------->
9. I know exactly what is expected of me.
10. I feel certain about how much authority I have.
11. Clear, planned goals exist for my placement/job.
12. I know that I have divided my time properly.
13. I know what my responsibilities are.
14. Explanations are clear as to what is to be done.
15. I receive incompatible requests from my cooperating teacher(s) and university supervisors. --------------->
16. I am able to apply information from my coursework to my teaching.
17. I have to work on unnecessary assignments in my courses (if applicable). ------------------------------------->
18. I receive assignments in my coursework without the necessary information to complete them (if applicable). ------->
19. I know exactly what is expected of me in my coursework (if applicable). ------------------------------------->
20. There is a clear relationship between my coursework and placement (if applicable). ------------------------->

PLEASE TURN TO REVERSE SIDE

BEST COPY AVAILABLE

5. MAJOR INTENSITY; EXTREMELY NOTICEABLE
4.
3. MEDIUM INTENSITY; MODERATELY NOTICEABLE
2.
1. NO INTENSITY; NOT NOTICEABLE

1. I feel emotionally drained from my work.
2. I feel used up at the end of the workday.
3. I feel fatigued when I get up in the morning and have to face another day on the job/placement. ------------>
4. I can easily understand how my students feel about things.
5. I feel I treat some students as if they were impersonal objects.
6. Working with people all day is really a strain for me.
7. I deal very effectively with problems of my students.
8. I feel burned out from my work/placement.
9. I feel I'm positively influencing other people's lives through my work. ------------------------------------>
10. I've become more callous toward people since I took this job/placement. ------------------------------------>
11. I worry that this job is hardening me emotionally.
12. I feel very energetic.
13. I feel frustrated by my job/placement.
14. I feel I'm working too hard on my job/placement.
15. I don't really care what happens to some students.
16. Working directly with people puts too much stress on me.
17. I can easily create a relaxed atmosphere with my students.
18. I feel exhilarated after closely working with my students.
19. I have accomplished many worthwhile things in this job/placement.
20. I feel like I'm at the end of my rope.
21. In my work, I deal with emotional problems very calmly.
22. I feel students blame me for some of their problems.
23. I feel emotionally drained from my internship/placement.
24. I feel emotionally drained from my coursework.
25. I feel emotionally drained from the combination of internship and coursework. ------------------------>
26. I feel burned out from my internship.
27. I feel burned out from my coursework.
28. I feel burned out from the combination of internship and coursework. ---------------------------------->
29. I feel frustrated by my internship.
30. I feel frustrated by my coursework.
31. I feel frustrated by the combination of internship and coursework.
32. I have accomplished many worthwhile things during this internship.
33. The coursework this semester has been worthwhile.
34. The combination of internship and coursework has been worthwhile.

Do you and your peers provide support to one another when needed? Y N
Do your supervisors provide you with support if and when needed? Y N
To what degree are you satisfied with your present job/placement?
1. Very Little 3. Moderately 5. Very Much
To what degree do you find your present job/placement stressful?
1. Very Little 3. Moderately 5. Very Much

THANK YOU FOR YOUR ASSISTANCE!!

BEST COPY AVAILABLE

Read each statement and decide if you ever feel this way about your job. Indicate how strongly by filling in the related bubble.

5. MAJOR STRENGTH; EXTREMELY NOTICEABLE
4. GREAT STRENGTH; VERY NOTICEABLE
3. MEDIUM STRENGTH; MODERATELY NOTICEABLE
2. MILD STRENGTH; BARELY NOTICEABLE
1. NO STRENGTH; NOT NOTICEABLE; NOT APPLICABLE

1. The pace of the school day is too fast.
2. I am not emotionally/intellectually stimulated teaching.
3. I lack promotion and advancement opportunities.
4. I do not receive an adequate salary and/or recompense.
5. I feel frustrated because I have to monitor pupil behavior.
6. I feel frustrated because of discipline problems in my classroom.
7. I rush in my speech.
8. I become impatient if others do things too slowly.
9. I think about other things during conversations.

15. My class/caseload is too big.
16. I have too much work to do.
17. I do not receive enough status and respect on my job.
18. I lack control over decisions made about matters in my classroom or school. --->
19. I feel frustrated because of inadequate discipline policies in my school and/or district. ------------------------------------->
20. I feel frustrated because my authority is often rejected by pupils and/or administration. ------------------------------------->
21. There is not enough time to get things done.
22. I have little time to relax and enjoy the time of day.
23. I detest wasting time.

29. There is too much administrative paperwork in my job.
30. I lack recognition for the extra work and good teaching that I do.
31. I am not progressing in my job as rapidly as I would like.

PLEASE TURN TO REVERSE SIDE

5. MAJOR STRENGTH; EXTREMELY NOTICEABLE
4. GREAT STRENGTH; VERY NOTICEABLE
3. MEDIUM STRENGTH; MODERATELY NOTICEABLE
2. MILD STRENGTH; BARELY NOTICEABLE
1. NO STRENGTH; NOT NOTICEABLE; NOT APPLICABLE

32. My personal attitudes, opinions, and values are not given airing in my classroom or school. ---------------------------->
33. I feel frustrated attempting to teach poorly motivated students.
34. I feel frustrated because certain students of mine would do better if they only tried harder. ---------------------------------->
35. I have to try doing more than one thing at a time.
36. I easily overcommit myself.

I respond to stress by/with...

43. feeling anxious.
44. feeling unable to cope.
45. making use of over-the-counter drugs.
46. stomach cramps.
47. feelings of increased blood pressure.
48. procrastinating.
49. becoming fatigued in a very short time.
50. feeling insecure.
51. feeling vulnerable.
52. making use of prescription drugs.
53. stomach pain of extended duration.
54. rapid breathing.
55. physical weakness.
56. feeling depressed.
57. calling in sick.
58. stomach acid.
59. feeling my heart pounding or racing.
60. sleeping more than usual.
61. feeling physically exhausted.

Your Social Security Number: _____-_______-_________
Your sex:
Your age:
How many hours per day do you teach?
How many hours per day do you prep?
Did your ASU training adequately prepare you for teaching? Y N
Have your views towards teaching become negative since you began? Y N
How many students, total, do you teach each day?

PLEASE CONTINUE TO NEXT PAGE

Read each statement and decide if you ever feel this way about your job. Indicate how much by filling in the related bubble.

5. EXTREMELY TRUE OF MY PLACEMENT/JOB
4.
3.
2.
1. DEFINITELY NOT TRUE OF MY PLACEMENT/JOB

1. I have to do things that should be done differently.
2. I have to work on unnecessary things.
3. I receive an assignment without the proper manpower to complete it. --->
4. I receive an assignment without adequate resources and materials to execute it. ------------------------------->
5. I work with two or more groups who operate quite differently.
6. I have to buck a rule or policy in order to carry out an assignment. -->
7. I receive incompatible requests from two or more people.
8. I do things that are apt to be accepted by one person and not accepted by others. ---------------------------------->
9. I know exactly what is expected of me.
10. I feel certain about how much authority I have.
11. Clear, planned goals exist for my job.
12. I know that I have divided my time properly.
13. I know what my responsibilities are.
14. Explanation is clear of what has to be done.

NEW CON

PLEASE TURN TO REVERSE SIDE

5. MAJOR INTENSITY; EXTREMELY NOTICEABLE
4.
3. MEDIUM INTENSITY; MODERATELY NOTICEABLE
2.
1. NO INTENSITY; NOT NOTICEABLE

1. I feel emotionally drained from my work.
2. I feel used up at the end of the workday.
3. I feel fatigued when I get up in the morning and have to face another day on the job. ------------------------>
4. I can easily understand how my students feel about things.
5. I feel I treat some students as if they were impersonal objects.
6. Working with people all day is really a strain for me.
7. I deal very effectively with problems of my students.
8. I feel burned out from my work.
9. I feel I'm positively influencing other people's lives through my work. ----------------------------------->
10. I've become more callous toward people since I took this job. --->
11. I worry that this job is hardening me emotionally.
12. I feel very energetic.
13. I feel frustrated by my job.
14. I feel I'm working too hard on my job.
15. I don't really care what happens to some students.
16. Working directly with people puts too much stress on me.
17. I can easily create a relaxed atmosphere with my students.
18. I feel exhilarated after closely working with my students.
19. I have accomplished many worthwhile things in this job.
20. I feel like I'm at the end of my rope.
21. In my work, I deal with emotional problems very calmly.
22. I feel students blame me for some of their problems.

Do you and your peers provide support to one another when needed? Y N
Do your supervisors provide you with support if and when needed? Y N
To what degree are you satisfied with your present job?
1. Very Little 3. Moderately 5. Very Much
To what degree do you find your present job stressful?
1. Very Little 3. Moderately 5. Very Much

THANK YOU FOR YOUR ASSISTANCE!!

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Appendix E

SPSS-X computer program(s) used to analyze the data

```
TITLE LASTLONG;  USE FOR FINAL LONGANAL ANALYSES MARCH 1988
SET WIDTH       80
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   /2 SEX 5, AGE 6-7,
      HSGPA 9-11, PREDGPA 12-14, HSNIC 15-17,
      ASUGPA 19-21, VSAT 22-23, PSAT 24-25,HSRANK 26-28,
      GPA3374 29-30, GPA4101 31-32, GPA4102 33-34,
      PROFKNOW 36-38, NTEAREA 39-41, COMSK 42-44
   /3 A1 TO A16 8-39, A18 TO A24 41-54, A25 56, A26 57-58,
      A27 TO A35 59-67, A36 TO A38 69-74 AX 79-80
   /4 B1 TO B16 8-39, B18 TO B24 41-54, B25 56, B26 57-58,
      B27 TO B35 59-67, B36 TO B38 69-74 BCX 79-80
   /5 C1 TO C16 8-39, C18 TO C24 41-54, C25 56, C26 57-58,
      C27 TO C35 59-67, C36 TO C38 69-74
   /6 D1 TO D16 8-39, D18 TO D24 41-54, D25 56, D26 57-58,
      D27 TO D35 59-67, D36 TO D38 69-74 DX 79-80
   /7 E1 TO E16 8-39, E18 TO E24 41-54, E25 56, E26 57-58,
      E27 TO E35 59-67, E36 TO E38 69-74 EX 79-80
   /8 F1 TO F16 8-39, F18 TO F24 41-54, F25 56, F26 57-58,
      F27 TO F35 59-67, F36 TO F38 69-74 FX 79-80
   /9 G1 TO G16 8-39, G18 TO G24 41-54, G25 56, G26 57-58,
      G27 TO G35 59-67, G36 TO G38 69-74 GX 79-80
  /10 H1 TO H16 8-39, H18 TO H24 41-54, H25 56, H26 57-58,
      H27 TO H35 59-67, H36 TO H38 69-74 HX 76-77 IX 79-80
missing values SEX TO COMSK a1 to h38 (9)
VARIABLE LABELS  SOCSEC 'SOCIAL SEC'
                 SEX 'SEX OF RESP'
                 AGE 'AGE OF RES'
                 ASUGPA 'GPA AT ASU'
                 VSAT 'VERB SAT PERCNTL'
                 PSAT 'PERF SAT'
                 PROFKNOW 'NTE PROF KNOWLEDGE'
                 COMSK 'NTE COMMNCTN SKILLS'
                 NTEAREA 'SPED NTE'
                 HSRANK 'HI SCHL RANK'
                 GPA3374 'GPA IN 3374'
                 GPA4101 'GPA IN 4101'
                 GPA4102 'GPA IN 4102'
                 A1 'FPERPRO'
                 A2 'SPERPRO'
                 A3 'FPRODIS'
                 A4 'SPRODIS'
                 A5 'FDISC'
                 A6 'SDISC'
                 A7 'FTIME'
                 A8 'STIME'
                 A9 'FEMOT'
                 A10 'SEMOT'
                 A11 'FBIOBEH'
                 A12 'SBIOBEH'
                 A13 'FPHYSFAT'
                 A14 'SPHYSFAT'
                 A15 'FASU'
                 A16 'SASU'
                 A18 'ROLECON'
                 A19 'ROLEAMB'
                 A20 'ROLEASU'
                 A21 'EMOTEX'
                 A22 'DEPERS'
                 A23 'NOACCOMP'
                 A24, 'ASUBURN'
                 A25, 'LEVEL'
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                A26, 'STUD
                A27, 'PREP'
                A28, 'ASUPREP'
                A29, 'NEG'
                A30, 'PEER'
                A31, 'ADMIN'
                A32, 'SATINT'
                A33, 'SATCORS'
                A34, 'STRSINT'
                A35, 'STRSCORS'
                A36, 'INMAN'
                A37, 'VOCED'
                A38, 'COGSTRAT'
 VALUE LABELS A25 1 'PRE KDRGRTN' 2 'GRADES 1-4' 3 'GRADES 5-8'
                4 'HIGH SCHOOL' 5 'OTHER'
              /A29 1 'YES' 2 'NO'
              /A30 1 'YES' 2 'NO'
              /A31 1 'YES' 2 'NO'
              /A32 1 'VRY LTL' 3 'MOD' 5 'VRY MCH'
              /A33 1 'VRY LTL' 3 'MOD' 5 'VRY MCH'
              /A34 1 'VRY LTL' 3 'MOD' 5 'VRY MCH'
              /A35 1 'VRY LTL' 3 'MOD' 5 'VRY MCH'
COMPUTE   BC1 = MEAN(B1,C1)
COMPUTE   BC2 = MEAN(B2,C2)
COMPUTE   BC3 = MEAN(B3,C3)
COMPUTE   BC4 = MEAN(B4,C4)
COMPUTE   BC5 = MEAN(B5,C5)
COMPUTE   BC6 = MEAN(B6,C6)
COMPUTE   BC7 = MEAN(B7,C7)
COMPUTE   BC8 = MEAN(B8,C8)
COMPUTE   BC9 = MEAN(B9,C9)
COMPUTE   BC10= MEAN(B10,C10)
COMPUTE   BC11= MEAN(B11,C11)
COMPUTE   BC12= MEAN(B12,C12)
COMPUTE   BC13= MEAN(B13,C13)
COMPUTE   BC14= MEAN(B14,C14)
COMPUTE   BC15= MEAN(B15,C15)
COMPUTE   BC16= MEAN(B16,C16)
COMPUTE   BC18= MEAN(B18,C18)
COMPUTE   BC19= MEAN(B19,C19)
COMPUTE   BC20= MEAN(B20,C20)
COMPUTE   BC21= MEAN(B21,C21)
COMPUTE   BC22= MEAN(B22,C22)
COMPUTE   BC23= MEAN(B23,C23)
COMPUTE   ASURC =    MEAN(A18,  B18,  C18,  D18)
COMPUTE   ASURA =    MEAN(A19,  B19,  C19,  D19)
COMPUTE   ASURT =    MEAN(A20,  B20,  C20)
COMPUTE   ASUFPER = MEAN(A1,  B1,  C1,  D1)
COMPUTE   ASUSPER = MEAN(A2,  B2,  C2,  D2)
COMPUTE   ASUFPRO = MEAN(A3,  B3,  C3,  D3)
COMPUTE   ASUSPRO = MEAN(A4,  B4,  C4,  D4)
COMPUTE   ASUFDIS = MEAN(A5,  B5,  C5,  D5)
COMPUTE   ASUSDIS = MEAN(A6,  B6,  C6,  D6)
COMPUTE   ASUFTIME= MEAN(A7,  B7,  C7,  D7)
COMPUTE   ASUSTIME= MEAN(A8,  B8,  C8,  D8)
COMPUTE   ASUFEM =  MEAN(A9,  B9,  C9,  D9)
COMPUTE   ASUSEM =  MEAN(A10,  B10,  C10,  D10)
COMPUTE   ASUFBIO = MEAN(A11,  B11,  C11,  D11)
COMPUTE   ASUSBIO = MEAN(A12,  B12,  C12,  D12)
COMPUTE   ASUFPHYS =MEAN(A13,  B13,  C13,  D13)
COMPUTE   ASUSPHYS =MEAN(A14,  B14,  C14,  D14)
COMPUTE   ASUFASU  =MEAN(A15,  B15,  C15,  D15)
COMPUTE   ASUSASU  =MEAN(A16,  B16,  C16,  D16)
COMPUTE   ASUFTOT = mean(ASUFPER , ASUFPRO , ASUFDIS , ASUFTIME ,
          ASUFEM , ASUFBIO, ASUFPHYS)
COMPUTE   ASUSTOT = MEAN(ASUSPER , ASUSPRO , ASUSDIS , ASUSTIME ,
               [illegible] , ASUSBIO , ASUSPHYS )
 COMPUTE    ASUEMOT = MEAN(A21,  B21,  C21,  D21)
 COMPUTE    ASUDEP  = MEAN(A22,  B22,  C22,  D22)
 COMPUTE    ASUACOMP= MEAN(A23,  B23,  C23,  D23)
 COMPUTE    ASUAVBRN= MEAN(A24,  B24,  C24,  D24)
 COMPUTE    ASUMBI = MEAN(ASUEMOT , ASUDEP, ASUACOMP)
 COMPUTE    TCHFPER = MEAN(E1,  F1,  G1)
 COMPUTE    TCHSPER = MEAN(E2,  F2,  G2, H2)
 COMPUTE    TCHFPRO = MEAN(E3, F3,  G3)
 COMPUTE    TCHSPRO = MEAN(E4,  F4,  G4, H4)
 COMPUTE    TCHFDIS = MEAN(E5,  F5,  G5)
 COMPUTE    TCHSDIS = MEAN(E6,  F6,  G6, H6)
 COMPUTE    TCHFTIME= MEAN(E7,  F7,  G7)
 COMPUTE    TCHSTIME= MEAN(E8,  F8,  G8, H8)
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 COMPUTE    TCHSEM  = MEAN(E10,  F10,  G10, H10)
 COMPUTE    TCHFBIO = MEAN(E11,  F11,  G11)
 COMPUTE    TCHSBIO = MEAN(E12,  F12,  G12, H12)
 COMPUTE    TCHFPHYS= MEAN(E13,  F13,  G13)
 COMPUTE    TCHSPHYS= MEAN(E14,  F14,  G14, H14)
 COMPUTE    TCHFTOT = MEAN(TCHFPER , TCHFPRO , TCHFDIS , TCHFTIME ,
            TCHFEM , TCHFBIO , TCHFPHYS)
 COMPUTE    TCHSTOT = MEAN(TCHSPER , TCHSPRO , TCHSDIS , TCHSTIME ,
            TCHSEM , TCHSBIO , TCHSPHYS)
 COMPUTE    TCHRC = MEAN(E18,  F18,  G18, H18)
 COMPUTE    TCHRA = MEAN(E19,  F19,  G19, H19)
 COMPUTE    TCHEMOT=MEAN(E21,  F21,  G21, H21)
 COMPUTE    TCHDEP =MEAN(E22,  F22,  G22, H22)
 COMPUTE    TCHACOMP = MEAN(E23,  F23,  G23, H23)
 COMPUTE    TCHMBI = MEAN(TCHEMOT , TCHDEP , TCHACOMP)
 COMPUTE    AFOT = MEAN(A1,  A3 , A5 , A7,  A9,  A11,  A13,  A15)
 COMPUTE    BFOT = MEAN(B1,  B3,  B5,  B7,  B9,  B11,  B13,  B15)
 COMPUTE    CFOT = MEAN(C1,  C3,  C5,  C7,  C9,  C11,  C13,  C15)
 COMPUTE    BCFOT =MEAN(BFOT, CFOT)
 COMPUTE    DFOT = MEAN(D1,  D3,  D5,  D7,  D9,  D11,  D13 , D15)
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 COMPUTE    ASOT = MEAN(A2,  A4,  A6,  A8,  A10,  A12,  A14,  A16)
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 COMPUTE    CSOT = MEAN(C2,  C4,  C6,  C8,  C10,  C12,  C14,  C16)
 COMPUTE    BCSOT= MEAN(BSOT, CSOT)
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 COMPUTE    FSOT = MEAN(F2,  F4,  F6,  F8,  F10,  F12,  F14)
 COMPUTE    GSOT = MEAN(G2,  G4,  G6,  G8,  G10,  G12,  G14)
 COMPUTE    HSOT = MEAN(H2,  H4,  H6,  H8,  H10,  H12,  H14)
 COMPUTE    AMBI = MEAN(A21, A22, A23)
 COMPUTE    BMBI = MEAN(B21, B22, D23)
 COMPUTE    CMBI = MEAN(C21, C22, C23)
 COMPUTE    BCMBI = MEAN(BMBI, CMBI)
 COMPUTE    AMBI = MEAN(A21, A22, A23)
 COMPUTE    BMBI = MEAN(B21, B22, B23)
 COMPUTE    CMBI = MEAN(C21, C22, C23)
 COMPUTE    DMBI = MEAN(D21, D22, D23)
 COMPUTE    EMBI = MEAN(E21,  E22,  E23)
 COMPUTE    FMBI = MEAN(F21,  F22,  F23)
 COMPUTE    GMBI = MEAN(G21,  G22,  G23)
 COMPUTE    HMBI = MEAN(H21,  H22,  H23)
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 COMPUTE    TCHFTOT2 = (EFOT + FFOT + GFOT)/3
 COMPUTE    ASUSTOT2 = (ASOT + BSOT + CSOT + DSOT)/4
 COMPUTE    TCHSTOT2 = (ESOT + FSOT + GSOT + HSOT)/4
 COMPUTE    AGER = (88-AGE)
COMPUTE HIGHNO = 1-(HSRANK/HSNIC)
RECODE AX (MISSING=01)
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RECODE EX (MISSING=4)
RECODE FX (MISSING=5)
RECODE GX (MISSING=6)
RECODE HX (MISSING=7)
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      A21 TO A23 (3F2.0) AMBI (1F2.0) AX (1F2.0)
      SEX (1F1.0) AGER (1F2.0) A25 (1F1.0) A26 (1F1.0)
      A29 TO A31 (3F1.0) AX (1F2.0) SUB (1F3.0)
  /BCFOT (1F2.0) BCSOT (1F2.0) BCX (1F2.0) BC18 TO BC19 (2F2.0) BCX (1F2.0)
      BC21 TO BC23 (3F2.0) BCMBI (1F2.0) BCX (1F2.0)
      SEX (1F1.0) AGER (1F2.0)
  /DFOT (1F2.0) DSOT (1F2.0) DX (1F2.0) D18 TO D19 (2F2.0) DX (1F2.0)
      D21 TO D23 (3F2.0) DMBI (1F2.0) DX (1F2.0)
      SEX (1F1.0) AGER (1F2.0) D25 (1F1.0) D26 (1F2.0)
      D29 TO D31 (3F1.0)
  /EFOT (1F2.0) ESOT (1F2.0) EX (1F2.0) E18 TO E19 (2F2.0) EX (1F2.0)
     E21 TO E23 (3F2.0) EMBI (1F2.0) EX (1F2.0)
     SEX (1F1.0) AGER (1F2.0) E25 (1F1.0) E26 (1F2.0)
     E29 TO E31 (3F1.0)
  /FFOT (1F2.0) FSOT (1F2.0) FX (1F2.0) F18 TO F19 (2F2.0) FX (1F2.0)
     F21 TO F23 (3F2.0) FMBI (1F2.0) FX (1F2.0)
     SEX (1F1.0) AGER (1F2.0) F25 (1F1.0) F26 (1F2.0)
     F29 TO F31 (3F1.0)
  /GX (1F2.0) GSOT (1F2.0) GX (1F2.0) G18 TO G19 (2F2.0) GX (1F2.0)
     G21 TO G23 (3F2.0) GMBI (1F2.0) GX (1F2.0)
     SEX (1F1.0) AGER (1F2.0) G25 (1F1.0) G26 (1F2.0)
     G29 TO G31 (3F1.0)
  /HX (1F2.0) HSOT (1F2.0) HX (1F2.0) H18 TO H19 (2F2.0) HX (1F2.0)
    H21 TO H23 (3F2.0) HMBI (1F2.0) HX (1F2.0)
    SEX (1F1.0) AGER (1F2.0) H25 (1F1.0) H26 (1F2.0)
    H29 TO H31 (3F1.0)
  /ASUFTOT (1F2.0) ASUSTOT  (1F2.0) IX      (1F2.0) ASURC (1F2.0) ASURA (1F2.0)
   IX      (1F2.0) ASUEMOT (1F2.0) ASUDEP (1F2.0) ASUACOMP (1F2.0) ASUMBI (1F2.0)
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   IX (1F2.0) TCHEMOT (1F2.0) TCHDEP (1F2.0) TCHACOMP (1F2.0) TCHMBI (1F2.0)
LIST
FINISH
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Appendix F

Master data file

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  3YR    25   16   25   21   16   17   15       2548   142243     076112113 3
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  3YR
  4YR
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  3YR    20   19   20   21   14   10   16       1537   171038     088212115 1
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  I-II
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009[redacted]
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 3YR
 4YR
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 3YR      18   15   15   18   12   10   14       1437   131238      166212115 1
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013[redacted]
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 I-II 3825413642504339283433183418        33332231263424
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   I-II
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   3YR
   4YR
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206[redacted]
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208[redacted]
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  4YR
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     3YR
     4YR
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     2YR
     3YR
     4YR
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     2YR
     3YR
     4YR
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     STUD
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     2YR
     3YR
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     1YR
     2YR
     3YR
     4YR
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     1YR
     2YR
     3YR
     4YR
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     I-II
     STUD
     1YR
     2YR
   3YR
   4YR
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    1YR
    2YR
    3YR
    4YR
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    2YR
    3YR
    4YR
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    1YR
    2YR
    3YR
    4YR
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    I-II
    STUD
    1YR
    2YR
    3YR
    4YR
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    1YR
    2YR
    3YR
    4YR
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    I-II
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    2YR
    3YR
    4YR
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   I-II
   STUD
   1YR
   2YR
   3YR
   4YR
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   2YR
   3YR
   4YR
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   3YR
   4YR
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   4YR
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   3YR
   4YR
229
    229
   PRE
   I-I
   I-II
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   3YR
   4YR
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Appendix G

Trimmed data file used in the final analyses

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905 [redacted]
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 4YR
906 [redacted]
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 2YR
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908 [redacted]
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 4YR
909 [redacted]
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 2YR
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 4YR
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 2YR
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 4YR
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 3YR
 4YR
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   3YR
   4YR
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   I-II 234319252742463126261010242 4       153047281630   2070422115255
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  STUD   23  11  22  26  12  12  11        133220211034
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 STUD
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 I-II 35233328302354366050222726382624 25253246283033 1222012113423
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 I-II 38333528322544366030101048262824 14132034163035 3090812115334
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  I-II
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  I-II
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  I-II
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165 [redacted]
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  I-II
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  I-II
  STUD
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  I-I
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 4YR
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 3YR
 4YR
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 I-II  45102421322218263432371734 16      18233318103619
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 3YR
 4YR
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 2YR
 3YR
 4YR
178 [redacted]
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 I-II  40332823231843354444131325234431 41525244243042
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 4YR
181 [redacted]
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 I-II  23333828403330313234151519192929 31322824183421
 STUD  45304030603841354840101023241010 3937  342234
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 3YR
 4YR
182 [redacted]
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 4YR
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  3YR
  4YR
202 [redacted]
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  3YR
  4YR
206 [redacted]
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  4YR
207 [redacted]
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  3YR
  4YR
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